IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 496 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ AUGUST 1960

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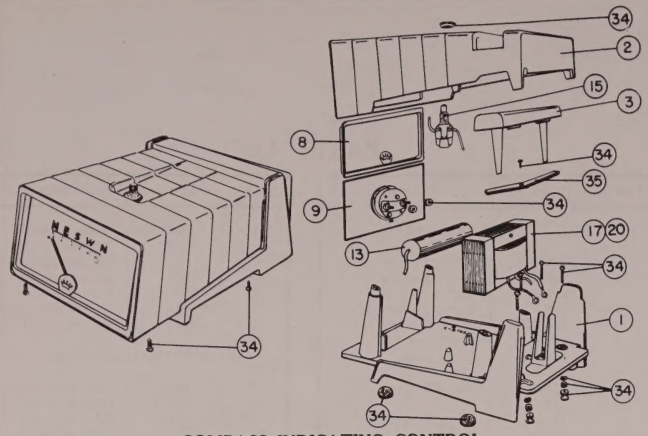
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

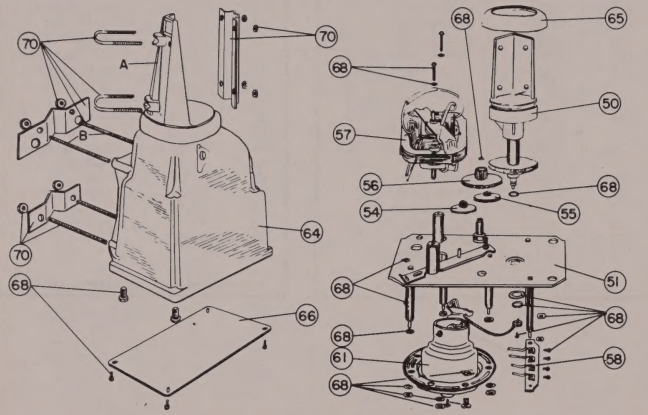
IN THIS ISSUE OF THE SERVICER:

Channel Master
Model 9522

COMPASS INDICATING MODEL



COMPASS INDICATING CONTROL



COMPASS INDICATING DRIVE

CHANNEL MASTER MODEL 9522

GENERAL SERVICING INFORMATION

Direction indication is accomplished by a telemetering circuit. When the primary switch is turned on, power is applied to the transformer and indication is obtained. When the direction switch is pressed, rotation is obtained with the indicator showing position at all times. The rotation speed is one R. P. M.

The indicating circuit is independend of variations in line voltage and cable length. The motor is a 30 volt capacitor run induction motor.

The control unit is housed in a two color housing provided with receptacles for interior components. Care should be exercised at disassembly to note exact position of all components for easy reassembly.

To calibrate, run drive so that rib "A" is centered between mounting screws "B". Loosen sender cable screw and adjust sender cable so that meter indicates slightly to left of South. Tighten sender cable screw.

TROUBLE SHOOTING

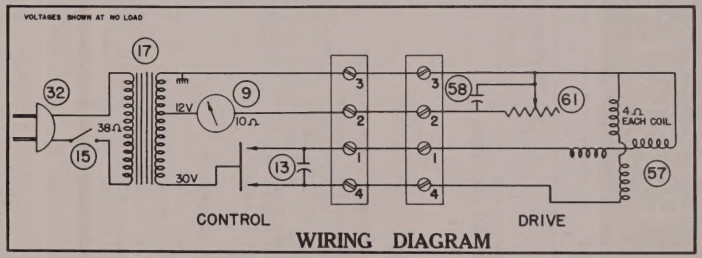
A. General:
1. Check for loose, shorted or broken wires.
2. Check for proper cable connection sequence.

B. Inoperative Drive - No Power to Transformer:
1. Check line cord, line switch and primary of transformer.

C. Inoperative Drive - No Power to Motor:
1. Check secondary of transformer.
2. Check directional switch.
3. Check conductors, number 1, 3, and 4 of cable.

D. Inoperative Drive - Power to Motor:
1. Check capacitor.
2. Check motor for open or shorted coils.
3. Check gear train.
4. Check motor bearings.

E. Operative Drive - No Indication:
1. Check conductors, number 2 and 3 of cable.
2. Check meter.
3. Check sender resistance with arm pulled against spring-should be 8 ohms.
4. Check for broken sender cable or loose screw at sender cable spool.



WIRING DIAGRAM

Schematic Diagram & Service Information Courtesy of Channel Master Crown Rotator Division

PARTS LIST

INDEX	PART NO.	NAME
	ROTATOR CONTROL PARTS	
1	*	Housing base
2	11728	Housing cover
3	11727	Switch rocker
4	*	Bottom cover
5	12105	Auto. housing base
6	12108	Dial skirt
7	*	Name plate
8	11968	Lens
9	12029	Meter & face
10	12143	Dial face
11	12138	Lamp socket
12	11748	Lamp
13	11911	Capacitor
14	12085	Capacitor
15	11207	Switch-push
16	12091	Switch-slide
17	12185	Trans. 110V-60 cy.
18	12136	Trans. 110V-60 cy.
19	12077	Trans. 110V-60 cy.
20	12048	Trans. 220V-50 cy.
21	12186	Trans. 220V-50 cy.
22	12187	Trans. 220V-50 cy.
23	12074	Motor & base
24	12181	First gear
25	12180	Second gear
26	12182	Third gear
27	12090	Plate-follower
28	12103	Rotating plate
29	12106	Knob-lower
30	12113	Knob-upper

* State Model No. of Rotator Control

INDEX	PART NO.	NAME
31	12193	Fastener kit
32	11088	Cord & Plug (all models)
33	12084	Strain reliever
34	12197	Fastener kit
35	11258	Switch blade
36	12141	Resistor assy.
	ANTENNA DRIVE PARTS	
50	11907	Mast assembly
51	11497-1	Plate w/studs
52	11497-2	Plate w/studs
53	11497-3	Plate w/studs
54	11428	First gear
55	11559	Second gear
56	11433	Third gear
57	11407	Motor
58	11492-1	Wire harness
59	11492-2	Wire harness
60	11492-3	Wire harness
61	11591	Position sender
62	12131	Cam
63	12132	Switch
64	12045	Housing-drive
65	11668	Umbrella
66	*	Cover
67	12192	Fastener kit
68	12191	Fastener kit
69	12195	Fastener kit
70	11939	Accessory kit

* State Model No. of Antenna Drive

PHOTOFACT® Folder

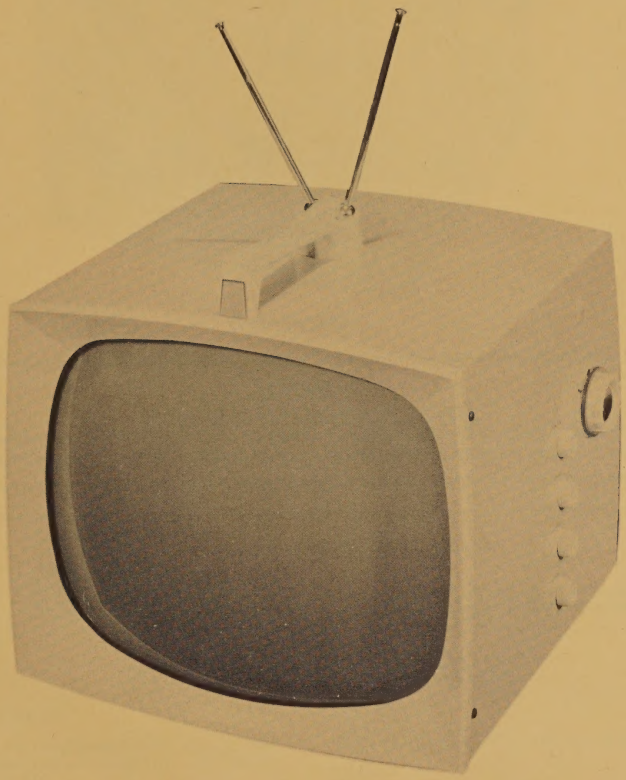
**CORONADO MODEL
TV2-9402B**

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

CORONADO MODEL
TV2-9402B



MODEL TV2-9402B

CORONADO MODEL
TV2-9402B

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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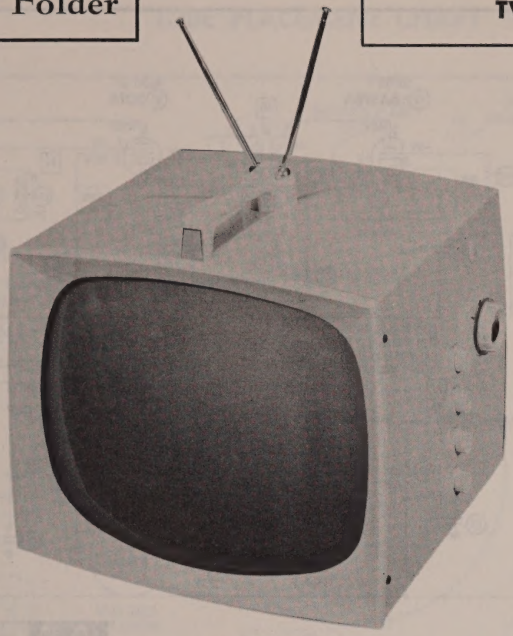
SET 496 FOLDER 1

PHOTOFACT® Folder

CORONADO MODEL TV2-9402B

CORONADO MODEL TV2-9402B



MODEL TV2-9402B

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Coronado, Model TV2-9402B
SUPPLIER	Gamble-Skogmo, Inc., 15 North 8th Street, Minneapolis, Minnesota
TYPE SET	Television Receiver
TUBES	VHF - Thirteen, UHF - Fourteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 110 Watts, 1.15 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

For picture tube and safety glass cleaning, it is necessary to remove the picture tube and escutcheon. (See "Picture Tube Removal" page 16.)

FUSE DEVICE

A 4.7Ω fusible resistor is used for low voltage power supply protection. (For location see R60 "Chassis Top View".) Later production models use a 4.5Ω fusible resistor.

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

No provision is made to vary the AGC on this receiver.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Frequency slug (B1). (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke on the neck of the picture tube.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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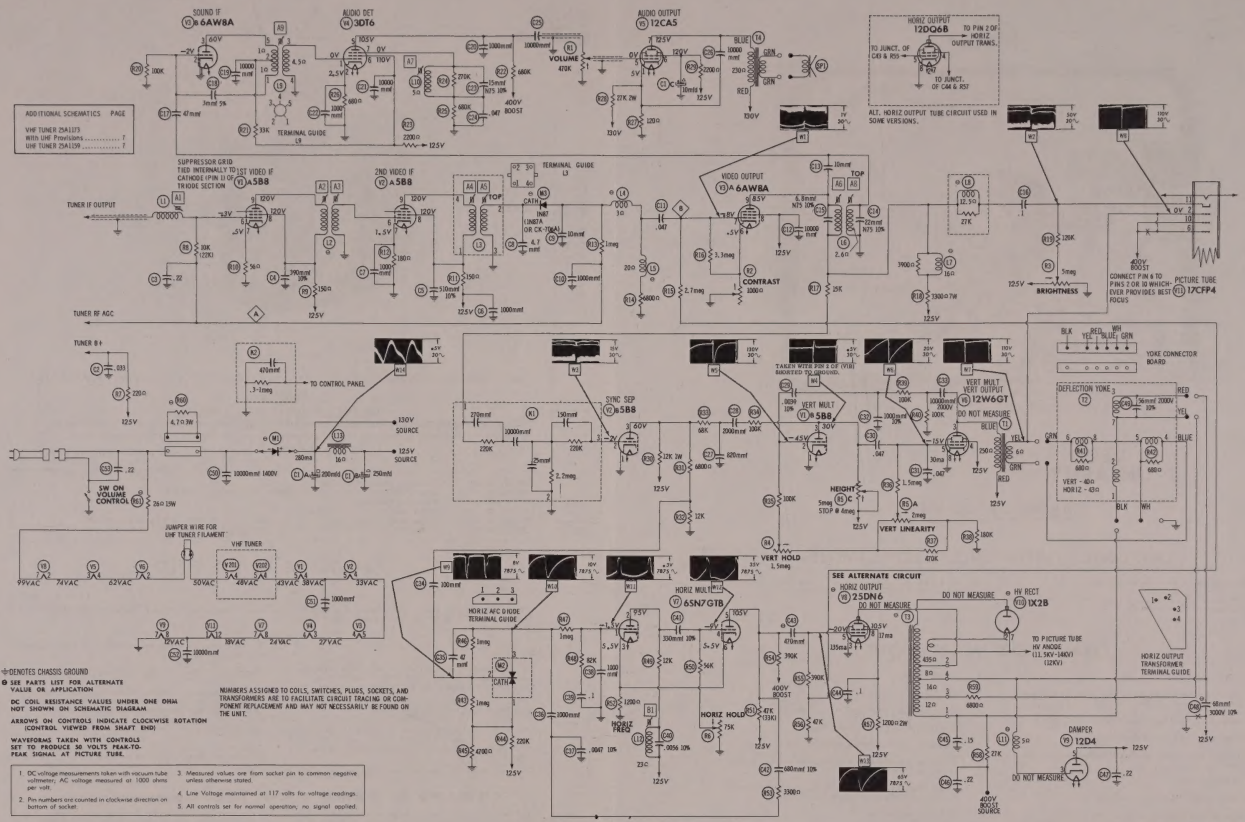
JA739R

SET 496 FOLDER 1


SOUND IF V8 6AW8A
AUDIO DET V4 3D7
AUDIO OUTPUT V5 12CA5
HORIZ OUTPUT V9 12DQ6B
TO PIN 2 OF HORIZ OUTPUT TRANS.
TO JUNCT. OF C63 & R59
TO JUNCT. OF C44 & R57
ALT. HORIZ OUTPUT TUBE CIRCUIT USED IN SOME VERSIONS.
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 25A173 WITH UHF Provisions 7
UHF TUNER 25A159 7
TERMINAL GUIDE L9
VOLUME 470K
BOOST
SUPPRESSOR GRID TIED INTERNALLY TO CATHODE (PIN 11 OF TRIODE SECTION
1ST VIDEO IF V1 A5B8
2ND VIDEO IF V2 A5B8
TERMINAL GUIDE L3
VIDEO OUTPUT V3 A 6AW8A
TOP
CONTRAST 1000Ω
TUNER IF OUTPUT
TUNER RF AGC
TUNER B+
BRIGHTNESS 5meg
400V BOOST
CONNECT PIN 6 TO PINS 7 OR 10 WHICH GIVES BEST FOCUS
PICTURE TUBE V11 17CFP4
YOKE CONNECTOR BOARD
DEFLECTION YOKE
VERT - 45Ω
HORIZ - 43Ω
TAKEN WITH PIN 2 OF (V18) GROUNDED.
VERT MULT V6 5B8
VERT MULT V7 12W6GT
DO NOT MEASURE
VERT LINEARITY 470K
HEIGHT 5meg
STOP @ 4meg
VERT HOLD 1.5meg
SYNC SEP V10 5B8
TO CONTROL PANEL
SOURCE
SW ON VOLUME CONTROL
JUMPER WIRE FOR UHF TUNER FILAMENT
VHF TUNER
HORIZ AFC DIODE TERMINAL GUIDE
HORIZ MULT V7 6SN7GTB
HORIZ FREQ
HORIZ HOLD 75K
SEE ALTERNATE CIRCUIT
HORIZ OUTPUT V8 25DN6
HV RECT V10 1X2B
TO PICTURE TUBE HV ANODE (11.5KV-14KV) (12KV)
HORIZ OUTPUT TRANSFORMER TERMINAL GUIDE
DAMPER V9 12D4
400V BOOST SOURCE
CORONADO MODELS TV2-9402B

⏚ DENOTES CHASSIS GROUND

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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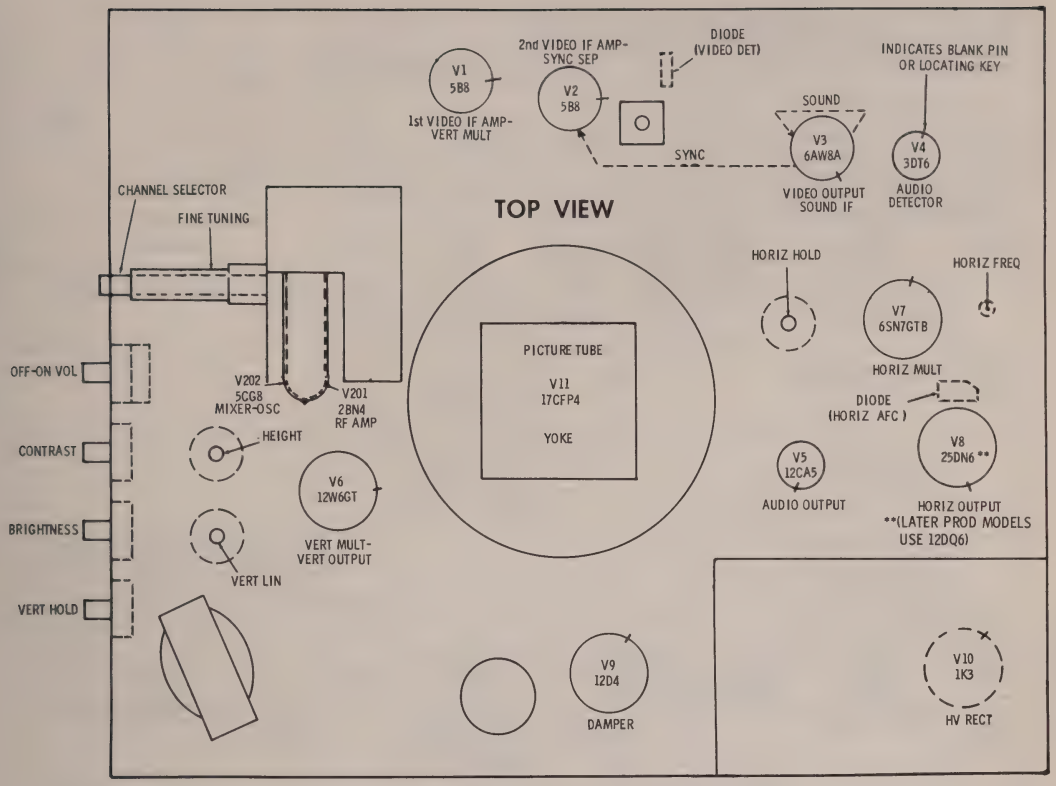
CORONADO MODELS TV2-9402B

FOLDER 1

TUBE PLACEMENT CHART



CORONADO MODEL
TV2-9402B

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

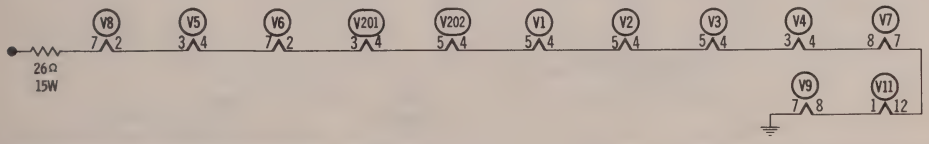
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (Line), Rect. (B+)

SWEEP FAILURE
No raster, has sound V7, V8, V9, V10, V11
No vertical deflection V1, V6
Poor vert. linearity or foldover V1, V6
Poor horiz. linearity or foldover V7, V8. V9
Narrow picture V7, V8, V9, Rect. (B+)
Vert. off freq. V1
Horiz. off freq. Diode (Horiz. AFC), V7

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V11
Has pic, no sound V3, V4, V5

SYNC FAILURE
No vert. sync V2
No horiz. sync V2 , Diode (Horiz. AFC)
No vert. or horiz. sync V2

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544, or 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Disable the tuner oscillator by replacing the oscillator tube (V202) with one having the oscillator grid pin removed.
Short the antenna terminals together but not to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	44.0MC (10MC Swp)	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector (Fig.1) to pin 9 (plate) of 5B8 (V1). Low side to chassis.	Mixer Plate Coil & A1	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.
2.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of 5B8 (V1). Low side to chassis.	"	"	"	Vert. Amp. thru detector (Fig. 1) to pin 9 (plate) of 5B8 (V2). Low side to chassis.	A2, A3	"
3.	"	High side to pin 6 (grid) of 5B8 (V2). Low side to chassis.	"	"	"	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis. (Across video det. load).	A4, A5	"
4.	Direct	High side to ungrounded tube shield floating over mixer-osc. tube (V202). Low side to chassis.	"	"	"	"		Retouch Mixer Plate Coil and A1 thru A5 as required for response similar to Fig. 3. Remove bias and replace V202 in its socket.

SOUND IF ALIGNMENT

Set the contrast control fully clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1000mmf Ceramic Capacitor	High side to point Ⓑ. Low side to chassis.	Not used	4.5MC (400~ 30% AM)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 4) to pin 11 (cathode) of picture tube. Low side to chassis.	A6	Turn A6 and A8 almost out of coil forms. Then adjust A6 for MINIMUM scope indication.
6.	"	"	4.5MC (15KC Swp)	Not used	"	Across speaker voice coil	A7, A8, A9	Use only enough sweep generator output to provide a usable pattern on scope. Turn A7 fully clockwise, then counter clockwise for maximum scope indication. Adjust A8 and A9 for maximum scope indication. Remove test equipment and tune in a local TV station. Retouch A7 for MINIMUM buzz.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

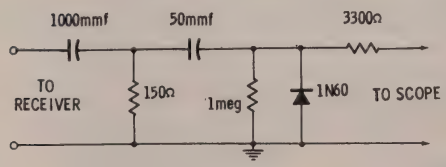


FIG. 1

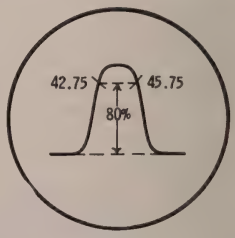


FIG. 2

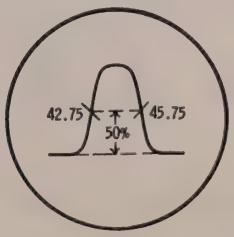


FIG. 3

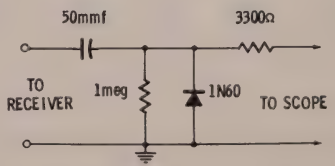
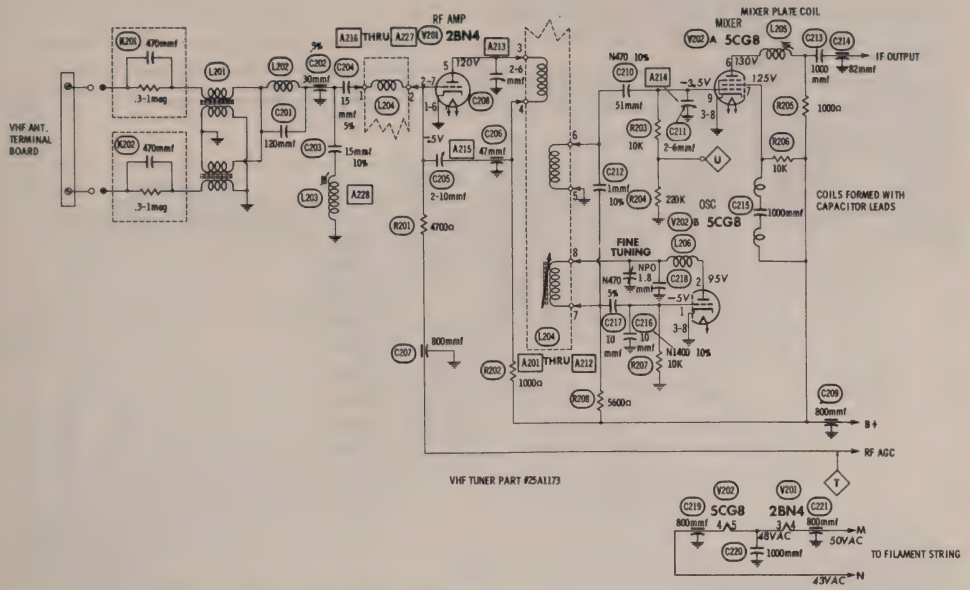


FIG. 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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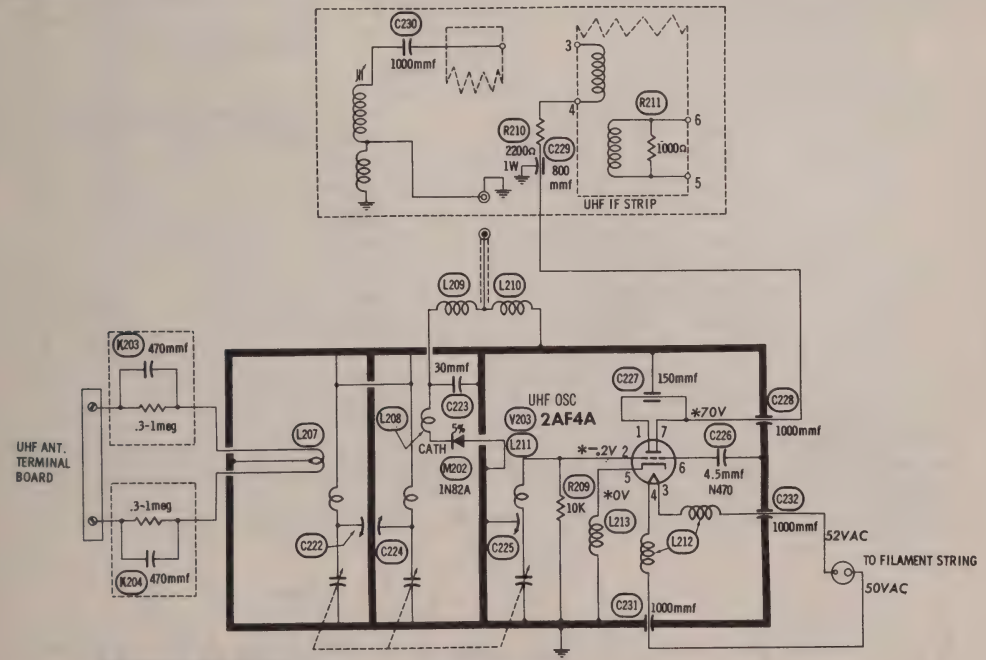
VHF TUNER 25A1173



* MEASURED IN "UHF" POSITION.

UHF TUNER PART #25A1159

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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REAR COVER 25A1164 & UHF TUNER 25A1159

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across video detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point ⊕. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point ⊕. Low side to chassis.	A213, A214	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202.
3.	"	"	"	"	"	Vert. Amp. thru detector (Fig. 203) to plate of 1st. video IF tube. Low side to chassis.	A215	Reduce bias to -1.5 volts. Adjust for MINIMUM response.
4.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

ANTENNA TRAP ALIGNMENT

Some types of interference can be reduced by adjusting A228. Observe the picture and adjust A228 for MINIMUM interference.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

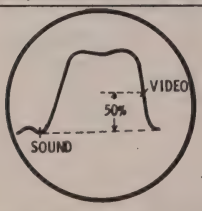


FIG. 201

FIG. 202

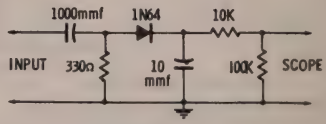
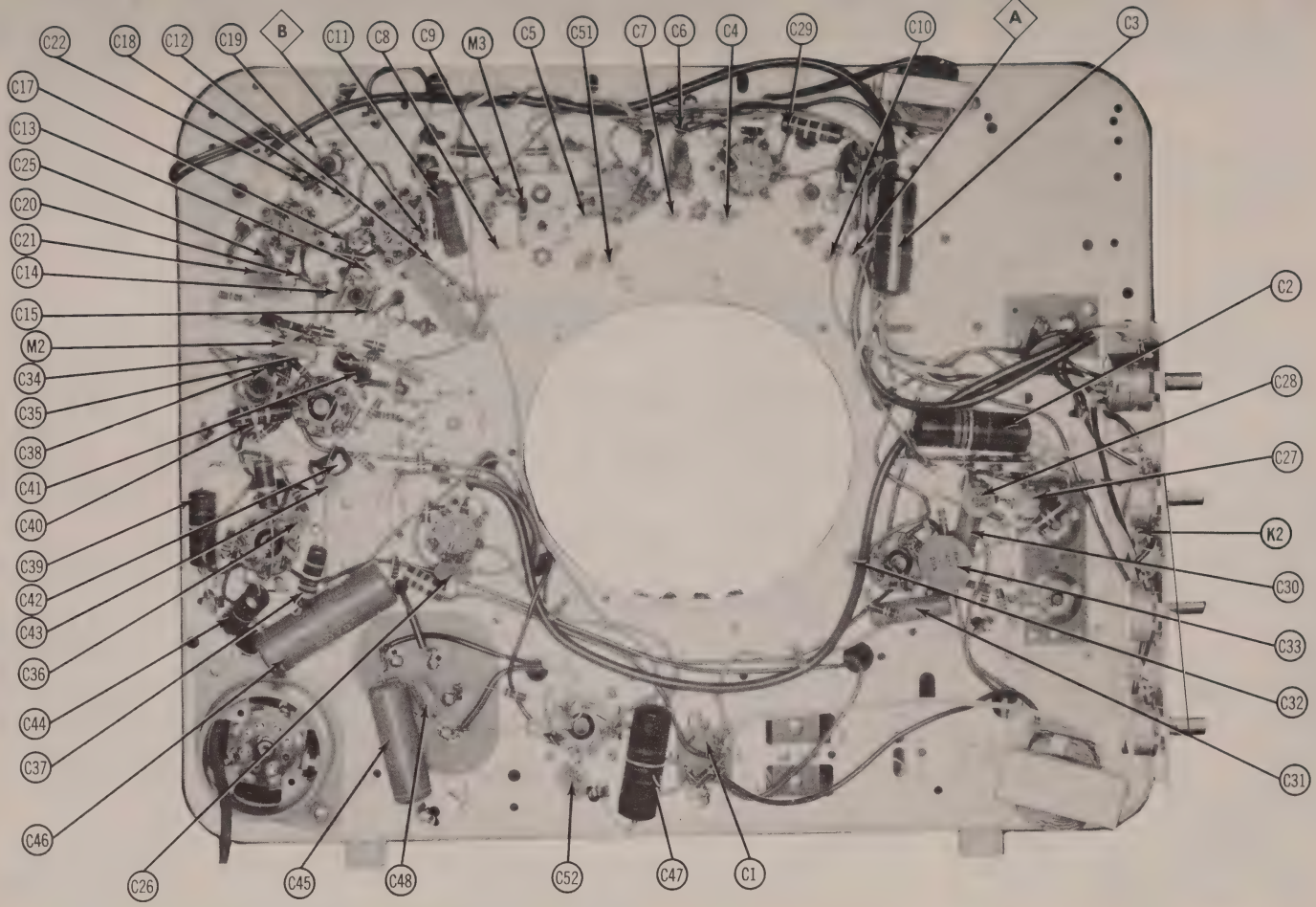


FIG. 203



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

TUBES

ITEM No.	CBS	GENERAL ELECTRIC	RAYTHEON	SYLVANIA
	USE	TYPE	USE	TYPE
V1	1st Video IF Amp. - Vert Mult.	5B8	V5 Audio Output V6 Vert. Mult. - Vert. Output	12CA5 15W6GT
V2	2nd Video IF Amp. - Sync Sep	5B8	V7 Horiz. Mult.	6BN7GTB
V3	Video Output - Sound IF Amp.	6AW8A	V8 Horiz. Output V9 Damper	1S5A (12DQ8) * 1S5A
V4	Audio Detector	3DT6	V10 HV Rectifier	1X2B (1K3) *

* Used in later production models.

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	CORONADO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V11	17CFP4		17CFP4 ①	17CFP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	CORONADO PART No.	ASEOVOYOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▣200	200	45J246	AFH2-12-50	2CG439	FP315, 8		TVL2-3453 *	
B	▣250	200							
C	▣10	300							

* Not normally in distributor's stock. Available thru distributor or order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						NOTES
			ASEOVOX PART No.	CENTRALAB PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.		
C2	.033 200V		P268N-033	DD-303	CU26S33	4DP-2-333	GEM-4133	47M-S33	
C3	.33 200V		P268M-33		CU33P33	SDP-1-334	GEM-4023	37M-P23	
C4	390 10%		DI-390	DD-391	L3T39	4DP-2-391	GEM-4139	47M-S39	
C5	510 10%		DI-500	DD-511	SR5T51	CCD-501	GP350	97T5-T50	
C6	1000		RPD-001	DD-102	BYA1D1	CCD-102	GP310	58K-D10	
C7	1000		RPD-001	DD-102	BYA1D1	CCD-102	GP310	58K-D10	
C8	4.7		NPO-4R7	TCZ-4R7	C0G4R7	CCT0-4R7	CNO-547	97TCC-V47	
C9	10		NPO-8I 10	TCZ-10	C0G1C	CCT0-100	CNO-410	97TCC-Q10	
C10	1000		RPD-001	DD-102	BYA1D1	CCD-102	GP310	58K-D10	
C11	.047 200V		P268N-047	DD-503	CU2S347	4DP-2-473	GEM-4147	37M-S47	
C12	10000		RPD-01	DD-103	BYA1D2	CCD-103	GP320	58K-D20	
C13	▣8		NPO-8I 10	TCZ-10	C0G1C	CCT0-100	CNO-410	97TCC-Q10	
C14	▣2 N75 10%	#60X33							
C15	▣8 N75 10%	#60X33							
C16	.1 200V		P268N-1	DF-104	CU3S2P1	3DP-3-104	GEM-301	37M-P1	
C17	▣1		HI 67	D6-470	L0Q4S1	CCD-470	GP467	35T5-Q47	
C18	▣ .5%		NPO-8I 3.9	D6-030	C0F3C	CCT0-3R3	CNO-533	97TCC-V33	T. Sub 1Tub
C19	10000		RPD-01	DD-103	BYA1SE1	CCD-103	GP310	58K-S10	390ch
C20	1000		RPD-001	DD-102	BYA1SD1	CCD-102	GP310	58K-D10	360ch
C21	10000		RPD-01	DD-103	BYA1SD2	CCD-103	GP320	58K-D20	
C22	10000		RPD-01	DD-103	BYA1SD1	CCD-102	GP310	58K-D10	
C23	▣5 N75 10%	#60X33							
C24	.047 200V		P268N-047	DD-503	CU2S347	4DP-2-473	GEM-4147	37M-S47	
C25	10000		RPD-01	DD-103	BYA1D2	CCD-103	GP320	58K-D20	
C26	10000		RPD-01	DD-103	BYA1SR1	CCD-103	GP320	58K-S20	
C27	680		DI-680	DD-681	BYA1DT68	CCD-681	GP382	35T5-T68	
C28	3000		RPD-002	DD-302	BYA1SD3	CCD-303	GP330	58K-D30	
C29	.0039 400V 10%		V34CE04 10%		P34MD4	SDP-1-392	GEM-3E4	58P-D39	
C30	.047 200V		P268N-047	DD-503	CU2S347	4DP-2-473	GEM-4147	37M-S47	
C31	.047 200V		P268N-047	DD-503	CU2S347	4DP-2-473	GEM-4147	37M-S47	
C32	1000 10%		DI-1000	DD-102	LR5D1	CCD-102	GP310	10T5-D10	
C33	10000 200V	#47X784					BL-510	BL-510	
C34	100		EI 100	DE-101	L0T1	CCD-101	GP310	10T5-T10	
C35	47		HI 47	D6-470	L0Q4T	CCD-470	GP467	35T5-Q47	
C36	1000		RPD-001	DD-102	BYA1SD1	CCD-102	GP310	58K-D10	
C37	.0047 400V 10%		V34CE047 10%		P34MD47	SDP-1-472	GEM-3E47	57M-D47	
C38	1000		RPD-001	DD-102	BYA1SD1	CCD-102	GP310	58K-D10	
C39	680		P268N-1	DF-104	CU3S2P1	3DP-3-104	GEM-301	37M-P1	
C40	.0056 400V 10%					SDP-1-562	GEM-3E56	58P-D56	
C41	330 10%		1469-00033	DH-331	BHT33	CM-20B-331K	MC3341	MB-333	
C42	680 10%		1469-00068	DH-681	BHT68	CM-20B-681K	MC3541	MB-368	
C43	470	①	RPD-00047	DD-471	BYA1P747	CCD-471	GP347	10T5-T47	
C44	.1 200V		P268N-1	DF-104	CU3S2P1	3DP-3-104	GEM-301	37M-P1	
C45	.15 600V		P68N-15		CU6S2P15	6DP-2-154	GEM-6015	67M-P15	
C46	.33 600V		P68N-33		CU6S2P33	6DP-2-334	GEM-6033	67M-P33	
C47	.33 200V		P268N-33		CU3S2P33	3DP-4-334	GEM-3033	37M-P33	
C48	▣6 3000V 10%	#47X763 ②					EDY-655		
C49	▣6 2000V 10%	? ②					EDY-656		
C50	10000 1600V		DAC-37	DDH-103	HV2E5S1	MDP-3-103	UAC-140	BL-810	
C51	1000		RPD-001	DD-102	BYA1SD1	CCD-102	GP310	58K-D10	
C52	1000		RPD-01	DD-103	BYA1SR1	CCD-103	GP310	58K-S10	
C53	.22 400V		P268N-22		CU34P22	4DP-2-224	GEM-4022	47M-P22	

① Later production models use .01mfd. ② Later production models use 85mmf @ 1KV. ③ Part of T2.
Coronado Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA						INSTALLATION NOTES
	RESIST-ANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.		
R1A	470K	½	40X444	B-60-S	A47-500K-Z	Q13-133	TA35A		Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.		
C	Switch			Not Req.	SWS-13	T6-1	U3-26		Power Off-On
R2	10000	½	40X439	B-60S		Q7-108	U3		Contrast
R3A	5meg	½	40X440	B-5T	A47-5meg-S	Q11-141	TA35L		Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.		
R4A	1. 5meg	½	40X441	B-7S3	A47-1. 5meg-S	Q11-158	TA35U		Vert. Hold
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.		
R5A	2meg	½	40X443	T7-7S	B47-2meg-S	B11-139	PTA35L		Vert. Lin.
B	Shaft			Not Req.	Not Req.	TM6	Not Req.		
C	4meg Stop			T7-6S *	B47-5meg-S*	B11-340 *	PTA4L *		Horiz. Hold
D	Shaft			Not Req.	Not Req.	TM6	Not Req.		
R8A	75K	½	40X442	B-3S	B47-100K-S	B11-135	PTA1L		Horiz. Hold
B	Shaft			Not Req.	Not Req.	TM6	Not Req.		

* Use 1 meg resistor in series with right hand terminal viewed from shaft end terminals down.

PARTS LIST AND DESCRIPTIONS

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R7	330Ω	
R8	10K	(22K) *
R9	160Ω	
R10	56Ω	
R11	100Ω	
R12	180Ω	
R13	1meg	
R14	6800Ω	
R15	2. 7meg	
R16	3. 3meg	
R17	18K	
R18	3300Ω 7W	#43X393
R19	120K	
R20	100K	
R21	33K	
R22	680K	
R23	2200Ω	
R24	270K	
R25	680K	

ITEM No.	RATING	REMARKS
R26	680Ω	
R27	120Ω	
R28	27K 2W	
R29	2200Ω	
R30	12K 1W	
R31	6800Ω	
R32	12K	
R33	68K	
R34	100K	
R35	100K	
R36	1. 5meg	
R37	470K	
R38	180K	
R39	100K	
R40	100K	
R41	680Ω	
R42	680Ω	
R43	220K	
R44	220K	

ITEM No.	RATING	REMARKS
R45	4700Ω	
R46	1meg	
R47	1meg	
R48	82K	
R49	12K	
R50	56K	
R51	47K	(33K) *
R52	12000	
R53	2300Ω	
R54	390K	
R55	390K	
R56	47K	
R57	1200Ω 2W	
R58	27K	
R59	6800Ω	
R60	4. 7Ω 2W	#43X394 ①
R61	360 15W	#43X392 ①

* Used in later production models. # Coronado Part Number.
① Later production models use 4. 5Ω fusible resistor (Part #43X298).
② Later production models use 45Ω 30W resistor (Part #43X311).

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	CORONADO Part No	REPLACEMENT DATA
X1	Sync Sep. Grid	26mmf, 150mmf, 270mmf, 10000mmf, 120K, 220K, 2. 2meg	76X24	
X2	Control Panel Isolation	470mmf, .1-1meg	76X11	Centralab Sprague — RC-471 ACI-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		CORONADO Part No	Gramer Messner Part No	Merit Part No.	Miller Part No.	Ram Part No.		
L1	1st Video IF	9A3427			TV-121	VF-4		
L2	2nd Video IF	9A3390						
	3rd Video IF	9A3644 ①						
L3	4th Video IF	9A3628						
L4	Resonant Choke	9A2432 ②						T. Sub
	Resonant Choke	9A2431 ①						1Tub
L5	Shunt Peaking Coil	9A47			TV-307	6136		390ch
	Shunt Peaking Coil	9A34 ①	19-4400	19-4400	TV-180	6134	VP-7	360ch
L6A	Sound Take-off	9A2433			TV-120			
B	4. 5MC Trap							
L7	Shunt Peaking Coil	9A46 ②			TV-301 ▲	6134 ▲	VP-7 ▲	255ch
	Shunt Peaking Coil	9A39 ①②	19-4301 ▲	19-4301 ▲	TV-197 ▲	6154 ▲		230ch
L8	Series Peaking Coil	9A46 ②			TV-196 ▲	6120 ▲	VP-5 ▲	185ch
	Series Peaking Coil	9A45 ①②	19-4190 ▲	19-4190 ▲	TV-195 ▲	6120 ▲		150ch
L9	Sound IF	9A2429						
L10	Quadrature Coil	9A2526	30-1007 *	30-1007 *	TV-131 †			
L11	RF Choke	9A345						T. Sub
		9A2432 ①②						

* Drill new mounting hole.
† Remove 15mmf capacitor.
▲ Parallel with 390Ω Resistor.
■ Parallel with 27K Resistor.

① Used in later production models.
② Wound on 39000 Resistor.
③ Wound on 27K Resistor.
(RC Part #CLA.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		CORONADO Part No.	Halldorson Part No.	Merit Part No.	Miller Part No.	Ram Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	
L12	Horiz. Osc.	9A3430	RS-7	TV-163 ①	S2H0 ①	H-102 ①	RC-110 ①		28S-7	WLC-3	

① Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA							
	CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT (1000 ~/s)	CORONADO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.
L13	280 A	16Ω	4 Hy.	53X203			T-901			C-37X

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								NOTES
		CORONADO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Rogers Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	
T1	Vert. Output	51X203	28S75 ①	A-2S5 ①			VO-10 ①	28S75 ①	A-11TX	
T2	Yoke-Horiz. (25MIC (90°)-Vert. (25MIC)	9A3153	T-48 ②③	M2F-2 ③	Y30T1R/43 ②③	PCM3045 ③①	DY-25A * ③①	Y-18 ②③	T-45 ▲ NW-1S ③	
	Rear Cover and Centering Device	2A489							TC-1 & TC-4	
	Yoke Clamp	30X288								
T3	Horiz. Output	53X361								
	Horiz. Output	53X372 †	FLY-146 *	HVO-134 *	X154 *		SO-397 *	FLY-146 *	D-134 *	

① Use 6 to 1 Turns Ratio.
② Use original rear cover, centering device, and yoke clamping network, if necessary.
③ Connect same as original.
† Used in later production models.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

	ORIGINAL TERMINAL (CONNECTIONS)	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	2	2	2	2		2	2	2
	4	4	4	4		4	4	4
	3	3	3	3		3	3	3
	1	1	1	1		1	1	1
Special Notes		④	③	④		③	④	③

④ Remove one turn from Blumsest winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI	SEC.	CORONADO Part No.	Halldorson Part No.	Merit Part No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	
T4	4500Ω	3-4Ω	51X192	24S44	A-3026	AU-601	A-3877	24S48	S-6X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO Part No.	QUAM Part No.	
SP1	4"	PM	3-4Ω	13A580 13A580-2	4A08	Model TV2-9402B Later production models

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	CORONADO Part No.	INTERNATIONAL Part No.	ITT Part No.	SARKES TARZIAN Part No.	SYLVANIA Part No.	CBS Part No.	
M1	.180A	66X19 ①	20C09 ①	EF504 ①	M500 ①	1N500 ①	① Silicon Type	
		66X22 ②	SD-9I ①②	K1615 ②			② Dual Selenium Diode	
M2						1N1007 ①		
M3								

* Used in later production models.

CRYSTAL DIODES

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CRYSTAL TYPE	CORONADO Part No.	CBS Part No.	RAYTHEON Part No.	SYLVANIA Part No.		
M3	1N87 *	66X20	1N266	1N266	1N266	Video Det. (Pigtail)	

* Some versions may use a 1N87A, CK-706A or 1N60 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO Part No.	NOTES
M4	Tuner	25A1U5	VHF, Model TV2-9402B
M5	Tuner	25A1U9	UHF, Model TV2-9402B
	Tuner	25A1U8-1	VHF, Later Production Models
	Tuner	25A1U9-1	UHF, Later Production Models
	Dipole Antenna Assembly	9A3433	JFD REPLACEMENT Part #TA-388, Model TV2-9402B
	Dipole Antenna Assembly	9A3433-1	Later Production Models

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

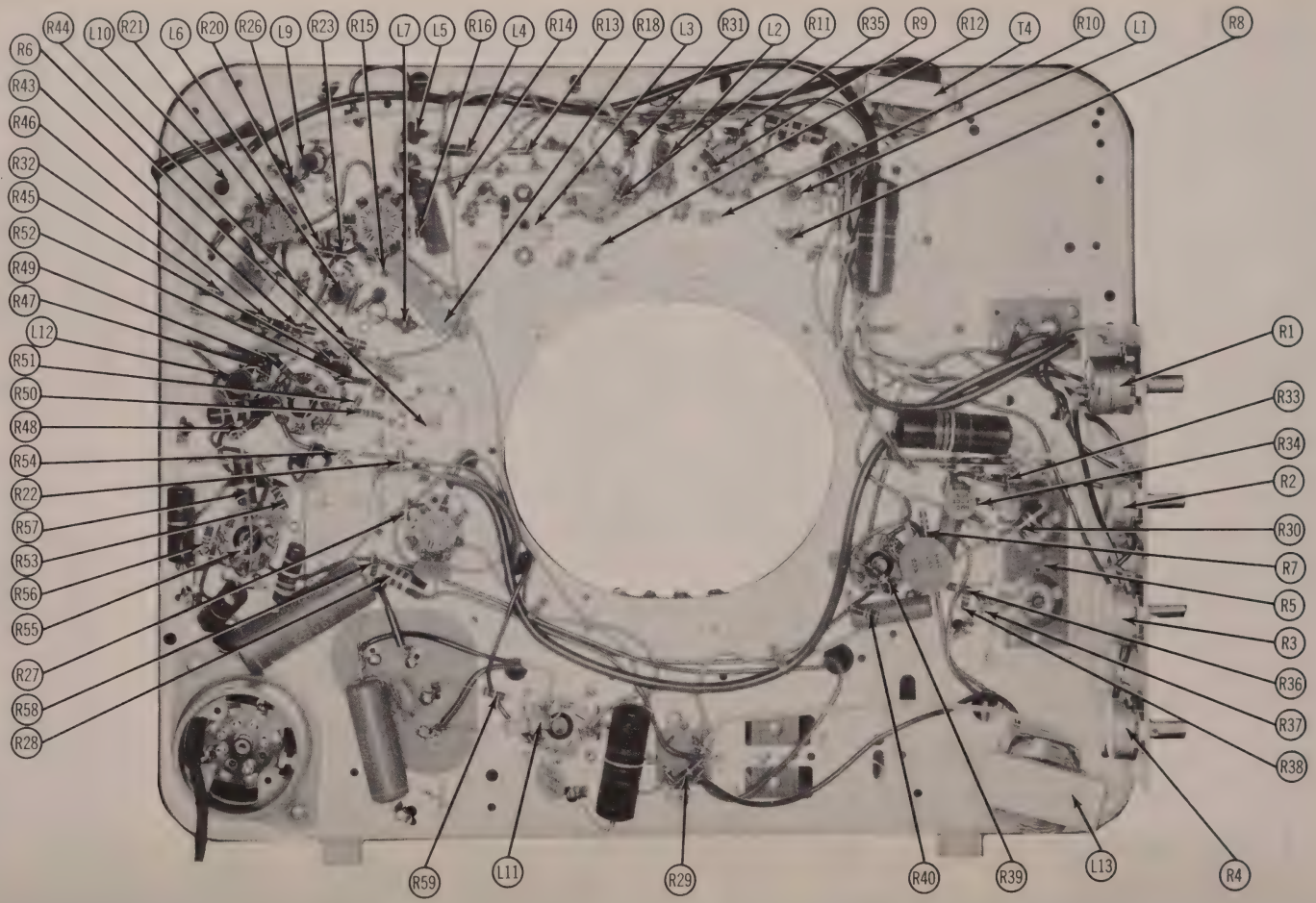
NAME	PART NO.	DESCRIPTION
Safety Glass	17X198	Model TV2-9402B
Safety Glass	17X198-1	Later Production Models
Knob	10A8S8	Channel Selector, Model TV2-9402B
Knob	19A537	Fine Tuning, Model TV2-9402B
Knob	10A835	Brightness, Vert. Hold, Contrast, Off-On Vol., Model TV2-9402B
Knob	10A839	UHF Tuning
Knob	10A808-2	UHF Tuning, Later Production Models
Knob	10A840	UHF Indicator
Knob	10A808-3	UHF Indicator, Later Production Models
Cabinet	8-38A8S	Model TV2-9402B
Handle	8-38A8T	Assembly, Model TV2-9402B

WIRING DATA

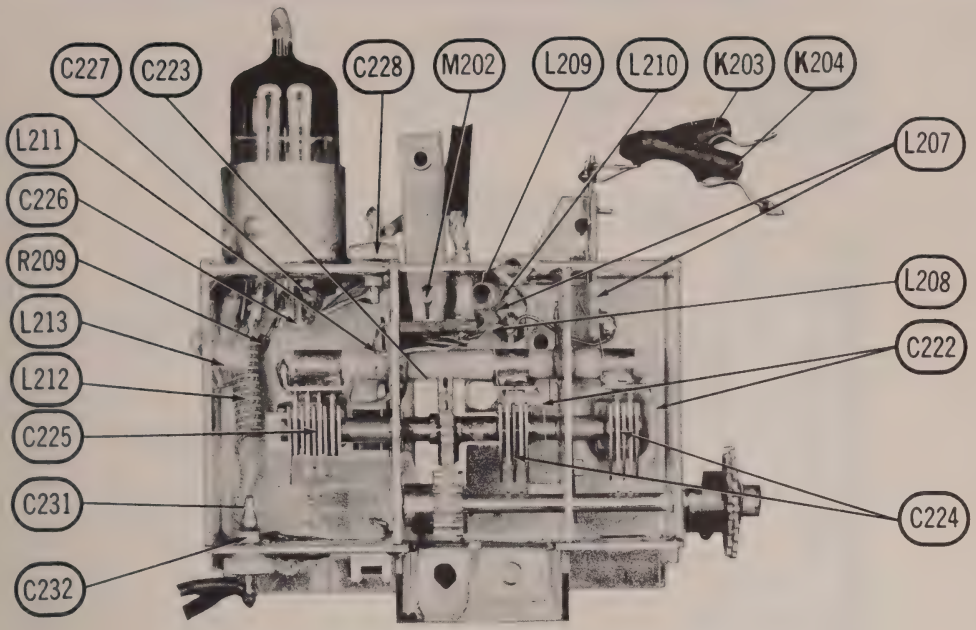
High Voltage Lead	Use BELDEN No. 8969
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8735 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8235
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8466 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

CORONADO MODEL TV2-9402B

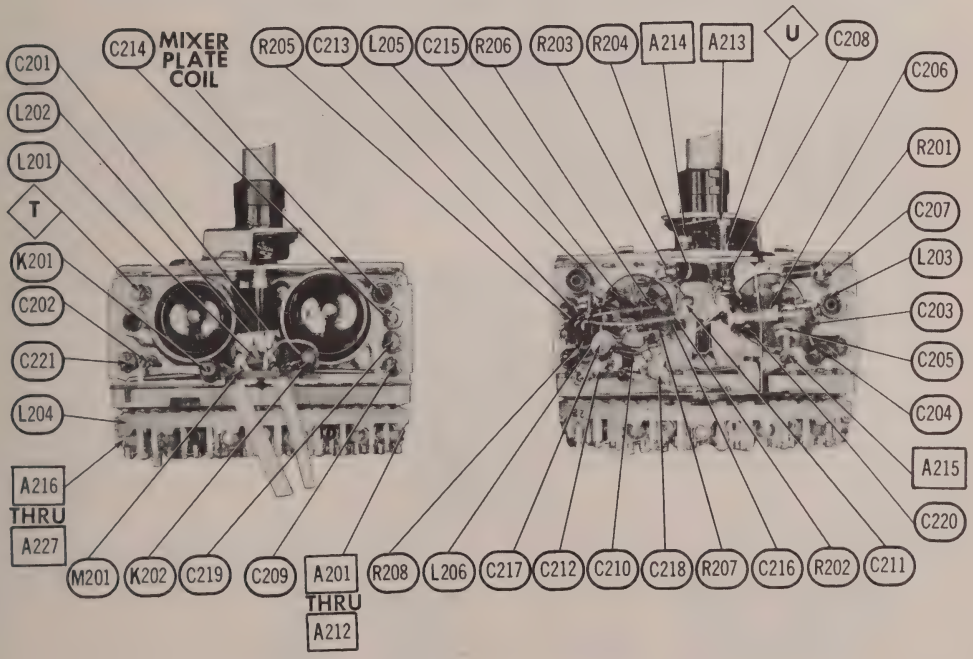
FOLDER 1



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



UHF TUNER 25A1159



VHF TUNER 25A1173

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V201	RF Amp.	2BN4
V202	Mixer-Osc.	5CG8

ITEM No.	USE	TYPE
V203	UHF Osc.	2AF4A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	PART No.	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120		BPD-00012	DD-121	L10T12	CCD-121	CNO-312	10TS-T12
C202	30 5%	#13M320U300NH-Z3						
C203	15 10%		NPO-DI 15	DD-150	L10Q15	CCD-150	CNO-415	10TS-Q15
C204	15 5%	#13L8GP150J		DTZ-15			CNO-415	10TCC-Q15
C205	2-10	#31B-206-07		829-10				
C206	47	#13M-013						
C207	800	#13M320EA801Z-Z3	EF-001	MFT-1000		CCF-102	CT280A	
C208	2-6	#31B-206-01		829-6		CV-3	CT552	
C209	800	#13M320EA801Z-Z3	EF-001	MFT-1000		CCF-102	CT280A	
C210	51 N470 10%	#13L-029				*		
C211	2-6	#31B-206-01		829-6		CV-3	CT552	10TCC-V10
C212	1 10%		NPO-SI 1	TCZ-1			CNO-510	10TCC-V10
C213	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C214	82	#13M320F850NH-Z3						
C215	1000	#31J-024	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C216	10 N1400 10%	#13L8F100F				*		
C217	10 N470 5%	#13L8T100D				*		
C218	1.8 NPO	#13L8C1R8C	NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C219	800	#13M320EA801Z-Z3	EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C221	800	#13M320EA801Z-Z3	EF-001	MFT-1000		CCF-102	CT280A	
C222								
C223	30 5%							
C224								
C225								
C226	4.5 N470	#13R-023				*		*
C227	150							
C228	1000	#13M-320EA102Z-03	EF-001	MFT-1000		CCF-102	CT280A	
C229	800	#13M-320EA801Z-Z3	EF-001	MFT-1000		CCF-102	CT280A	
C230	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C231	1000	#13M-320EA102Z-03	EF-001	MFT-1000		CCF-102	CT280A	
C232	1000	#13M-320EA102Z-03	EF-001	MFT-1000		CCF-102	CT280A	

"STANDARD COIL" Part Numbers.
* Not normally listed in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	4700Ω	
R202	1000Ω	
R203	10K	
R204	220K	

ITEM No.	RATING	REMARKS
R205	1000Ω	
R206	10K	
R207	10K	
R208	5600Ω	

ITEM No.	RATING	REMARKS
R209	10K	
R210	2200Ω 1W	
E211	1000Ω	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Ant. Coupling	470mmf, .3-1meg	13P-198	Centralab Sprague	RC-471 AC1-1
K202	Ant. Coupling	470mmf, .3-1meg	13P-198	Centralab Sprague	RC-471 AC1-1
K203	Ant. Coupling	470mmf, .3-1meg	13P-198	Centralab Sprague	RC-471 AC1-1
K204	Ant. Coupling	470mmf, .3-1meg	13P-198	Centralab Sprague	RC-471 AC1-1

NOTE : Part numbers listed above are "Standard Coil" part numbers.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	VHF Ant. Trans.	31T-3066 †	
L202	IF Trap	34A763 †	
L203	IF Trap	34A762	
L204	Ant., RF, Mixer Grid & Osc.Coils	31T-2087	Includes rotor disc assy.
L205	Mixer Plate	31U-580	
L206	RF Choke	25A-211-01	

ITEM No.	USE	PART No.	NOTES
L207	UHF Ant. Input Assy.	31T-2163	
L208	RF Choke	25A-208	
L209	RF Choke	31K-137-02	
L210	RF Choke	31K-137-021	
L211	RF Choke	25A-207	
L212	Fil. Choke	31K-137-01♛	
L213	Cathode Choke	31K-137-018	

NOTE: Part numbers listed above are "Standard Coil" part numbers. † Part of M201.

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

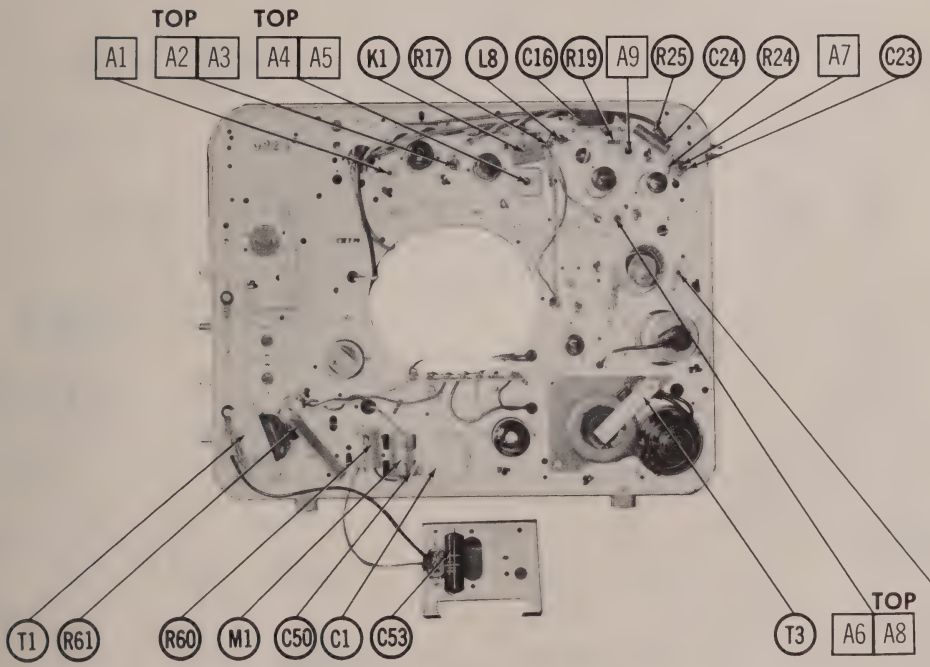
MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M201	Ant. Input Assy.	31T-2086	Includes L201, L202, C201, K201, K202
	UHF Adaptor	25A1164	Includes rear cover
	VHF Cover	31T-3093	
	Contact Spring	23A-132	
	Osc. Slug	15A-276	
	UHF Extension Contact	23A-148-01	
	UHF Board Assy.	31J-012-01	

NOTE: Part numbers listed above are "Standard Coil" part numbers.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		CORONADO PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M202	1N82A		1N82A	1N82A	1N82A	UHF Mixer (Clip-in)



CHASSIS—TOP VIEW

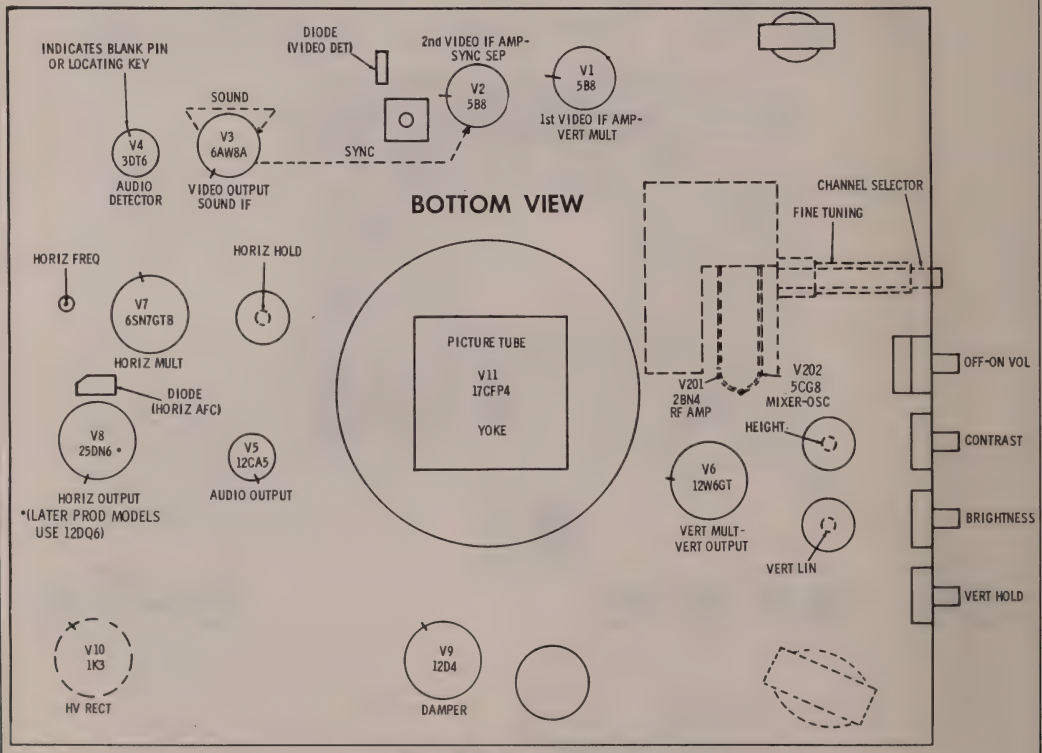
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	5B8	0Ω	•1.2meg	•†2meg	11Ω	13Ω	1meg	56Ω	†150Ω	†150Ω
V2	5B8	0Ω	2.4meg	†9500Ω	9Ω	11Ω	.25Ω	180Ω	†150Ω	†150Ω
V3	6AW8A	0Ω	100K	†35K	7Ω	9Ω	•50Ω	1.5meg	†16Ω	†3300Ω
V4	3DT6	4.5Ω	680Ω	7Ω	6Ω	†710K	†2200Ω	680K		
V5	12CA5	120Ω	NC	23Ω	19Ω	0Ω	†2200Ω	†230Ω		
V6	12W6GT	TP	15Ω	†265Ω	†16Ω	• 2.3meg	TP	19Ω	0Ω	
V7	6SN7GTB	3meg	†12K	1200Ω	• 100K	†47K	1200Ω	4.5Ω	6Ω	
V8	25DN6**	TP	23Ω	0Ω	TP	435K	TP	30Ω	†1200Ω	TOP CAP †13Ω
V9	12D4	NC	TP	¶550K	NC	†16Ω	NC	0Ω	3Ω	
V10	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †447Ω
V11	17CFP4	3Ω	12Ω	Pin 6 †27K	Pin 10 †27K	Pin 11 •170K	Pin 12 4.5Ω			
V201	2BN4	0Ω	1meg	15Ω	14.5Ω	†1200Ω	0Ω	1meg		
V202	5CG8	10K	†5800Ω	0Ω	13Ω	14.5Ω	†1200Ω	†10K	0Ω	230K
V203	2AF4A	*†3500Ω	*10K	13.5Ω	12.5Ω	*.1Ω	*10K	*†3500Ω		

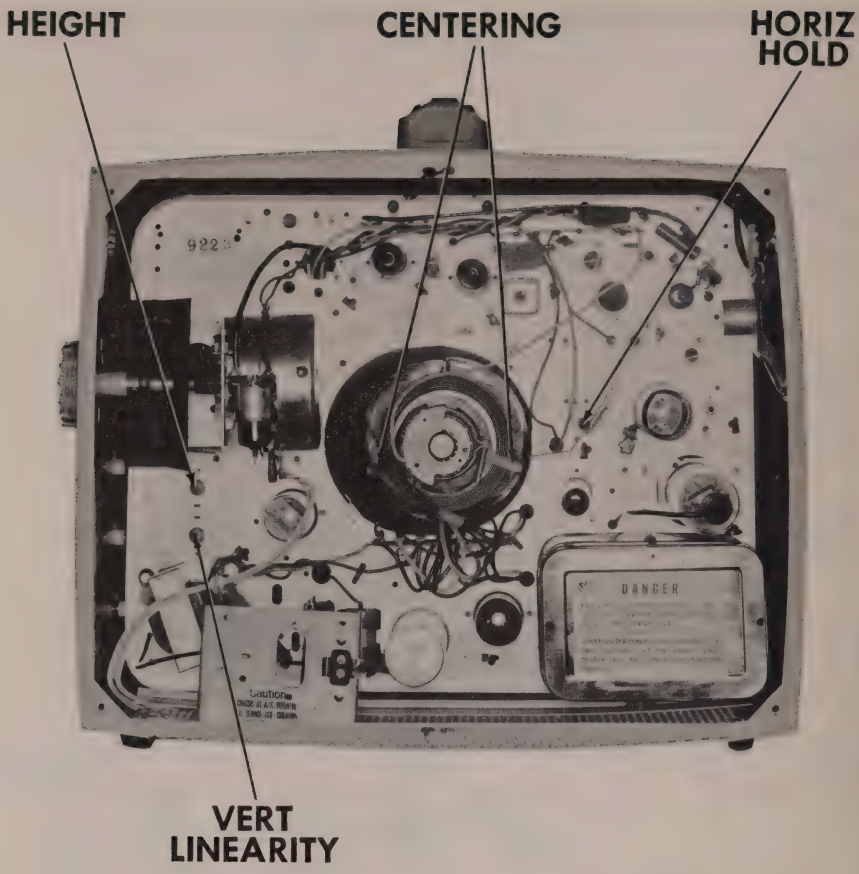
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 130V SOURCE.
† MEASURED FROM PIN 3 OF V9.
•• LATER PROD MODELS USE 12DQ6

NC NO CONNECTION
TP TIE POINT
* MEASURED IN "UHF" POSITION.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the Horizontal Hold to the center of its range.

Tune in a TV station and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally.

Proper adjustment is indicated when it is possible to switch from one channel to another without the picture losing sync.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 5 metal screws holding rear cover. Remove antenna connections. Remove rear cover.
2. Remove 6 push-on type knobs from side of cabinet.
3. Remove 2 screws holding interlock bracket.
4. Remove yoke leads, speaker leads, and picture tube socket.
5. Remove speaker.
6. Lay receiver face down on a soft surface.
7. Remove 2 chassis bolts from the bottom of the cabinet, and 2 from the top inside. Unsolder isolation unit from cabinet.
8. Lift chassis part way out, then remove HV lead and pic-tube tube mounting bracket ground wire.
9. Lift chassis.

PICTURE TUBE REMOVAL

1. Remove rear cover. (See Step 1 "Chassis Removal".)
2. Remove picture tube socket and yoke.
3. Remove 2 screws holding handle and antenna assembly.
4. Remove 2 screws on each side and one at bottom holding front escutcheon.
5. Pull escutcheon out part way and disconnect HV lead and picture tube mounting bracket ground wire.
6. Remove escutcheon.
7. Remove 4 screws holding picture tube mounting strap.
8. Remove picture tube.

PHOTOFACT® Folder with CIRCUITRACE®

ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573

MODEL E3002W (CH. 16E21Q, S-48573)

ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573

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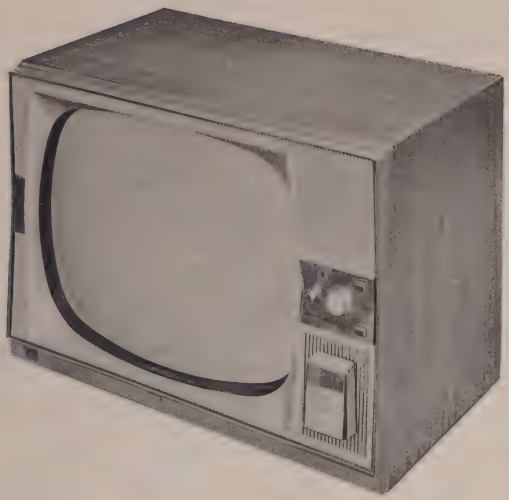
ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573



MODEL E3002W (CH. 16E21Q, S-48573)

TRADE NAME	ZENITH	MODELS	CHASSIS
		E2301R, Y, E2302R, E2315L, Y, E2316E, R, W, E2345E, R, W, E2346E, R, W, E2347E, L, M, R, W, E2348E, R, W, E2350H, M, R, W, E2384H, R	16E21
		E3000R, Y, E3002E, R, W, E3004E, R, W, E3005E, M, R, W, E3006E, R, W, Y, E3007E, R, M, W, E3008R, E3009E, W, Y	16E21Q
		E2301RU, YU, E2302RU, E2315LU, YU, E2316EU, RU, WU, E2345EU, RU, WU, E2346EU, RU, WU, E2347EU, LU, MU, RU, WU, E2348EU, RU, WU, E2350HU, MU, RU, WU, E2384HU, RU	16E21U
		E2384H, HU, R, RU (Stereo Amplifier)	5B28
		E3000R, Y (Remote Control Receiver)	S-48563
		E3002E, R, W, E3005E, M, R, W, E3007E, R, M, W (Remote Control Rec.)	S-48573
		E3004E, R, W (Remote Control Receiver)	S-48433
		E3006E, R, W, Y, E3008R, E3009E, W, Y (Remote Control Receiver)	S-48434

MANUFACTURER	Zenith Radio Corp., 6001 Dickens Avenue, Chicago 39, Illinois
TYPE SET	Television Receiver (16E21Q Chassis with Remote Control)
TUBES	TV: VHF - Sixteen, UHF - Seventeen Remote Control Receiver: Six
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 260 Watts, 2.45 Amp. @ 117 Volts AC (While Tuning) 240 Watts, 2.2 Amp. @ 117 Volts AC (Not Tuning)
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

FOR SERVICE INFORMATION ON VHF TUNERS 175-131, 175-132, 175-133, AND UHF TUNER 175-8 - SEE PHOTOFACT SET 466 FOLDER 2

DISASSEMBLY INSTRUCTIONS

TV CHASSIS REMOVAL MODEL E3002W

1. Remove 4 push-on type knobs from the front of cabinet and 1 from back of cabinet.
2. Remove 8 metal screws holding rear cover. Remove rear cover.
3. Remove speaker leads, 4 plug-in type leads at tuner, and 2 chassis plugs to remote control receiver.
4. Remove 4 chassis bolts under cabinet.
5. Pull chassis straight out.

PICTURE TUBE REMOVAL

1. It is necessary to remove the TV Chassis for picture tube removal (See "Chassis Removal").
2. Remove picture tube socket and high voltage lead.
3. Loosen picture tube mounting.
4. Remove picture tube.

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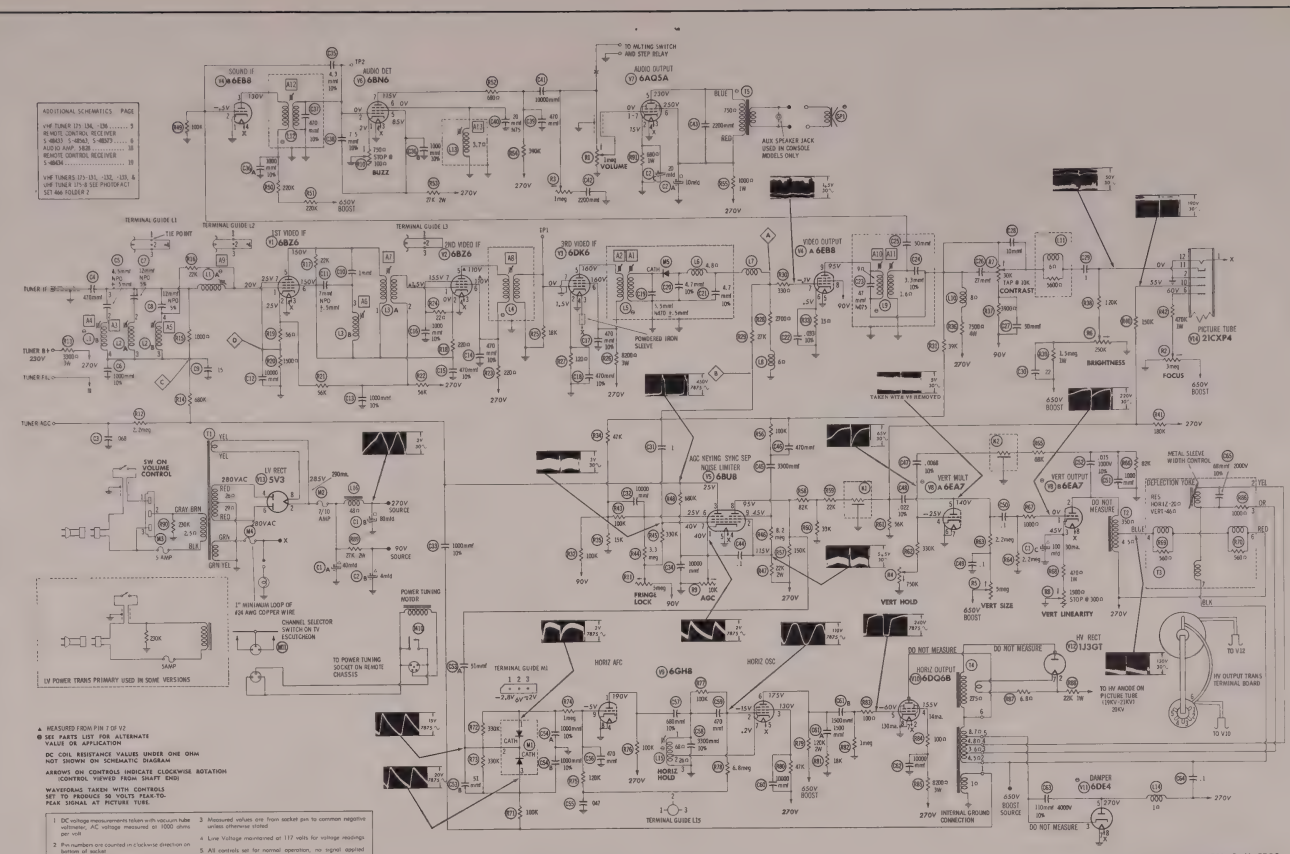
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 171-134, -136 9
40 VOLTS CONTROL RECEIVER
S-48433 S-48563 S-48573 6
AUDIO AMP. 16JB 18
REMOTE CONTROL RECEIVER
S-48834 19
VHF TUNERS 171-131, -132, -133, & UHF TUNER 171-8 SIZE PHOTOFACT SET 466 FOLDER 2
SOUND IF
AUDIO DET V6 6BN6
AUDIO OUTPUT V7 6AQ5A
BUZZ
VOLUME
AUX SPEAKER JACK USED IN CONSOLE MODELS ONLY
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6BZ6
3RD VIDEO IF V3 6DK6
VIDEO OUTPUT V4 6EB8
CONTRAST
BRIGHTNESS
FOCUS
PICTURE TUBE V14 21CXP4
TAKEN WITH VR REMOVED
POWDERED IRON SLEEVE
SW ON VOLUME CONTROL
LV RECT V13 5V3
5 AMP
270V SOURCE
90V SOURCE
1" MINIMUM LOOP OF #24 AWG COPPER WIRE
CHANNEL SELECTOR SWITCH ON TV ESCUTCHEON
POWER TUNING MOTOR
TO POWER TUNING SOCKET ON REMOTE CHASSIS
LV POWER TRANS PRIMARY USED IN SOME VERSIONS
AGC KEYING SYNC SEP VIDEO LIMITER V5 6BU8
FRINGE LOCK
AGC
VERT MULT V8 A 6EA7
VERT HOLD
VERT SIZE
VERT OUTPUT V8 B 6EA7
VERT LINEARITY
DO NOT MEASURE
METAL SLEEVE WIDTH CONTROL
DEFLECTION YOKE
HV RECT V12 1J3GT
TO HV ANODE ON PICTURE TUBE (ONLY 25KV)
TO V12
HV OUTPUT TRANS TERMINAL BOARD
HORIZ AFC V9 6GH8
HORIZ OSC
HORIZ HOLD
HORIZ OUTPUT V10 6DQ6B
INTERNAL GROUND CONNECTION
DAMPER V11 6DE4
TERMINAL GUIDE L1
TERMINAL GUIDE L2
TERMINAL GUIDE L3
TERMINAL GUIDE L5
TERMINAL GUIDE M1
TUNER IF
TUNER B+ 230V
TUNER FIL.
TUNER AGC
MEASURED FROM PIN 7 OF V2
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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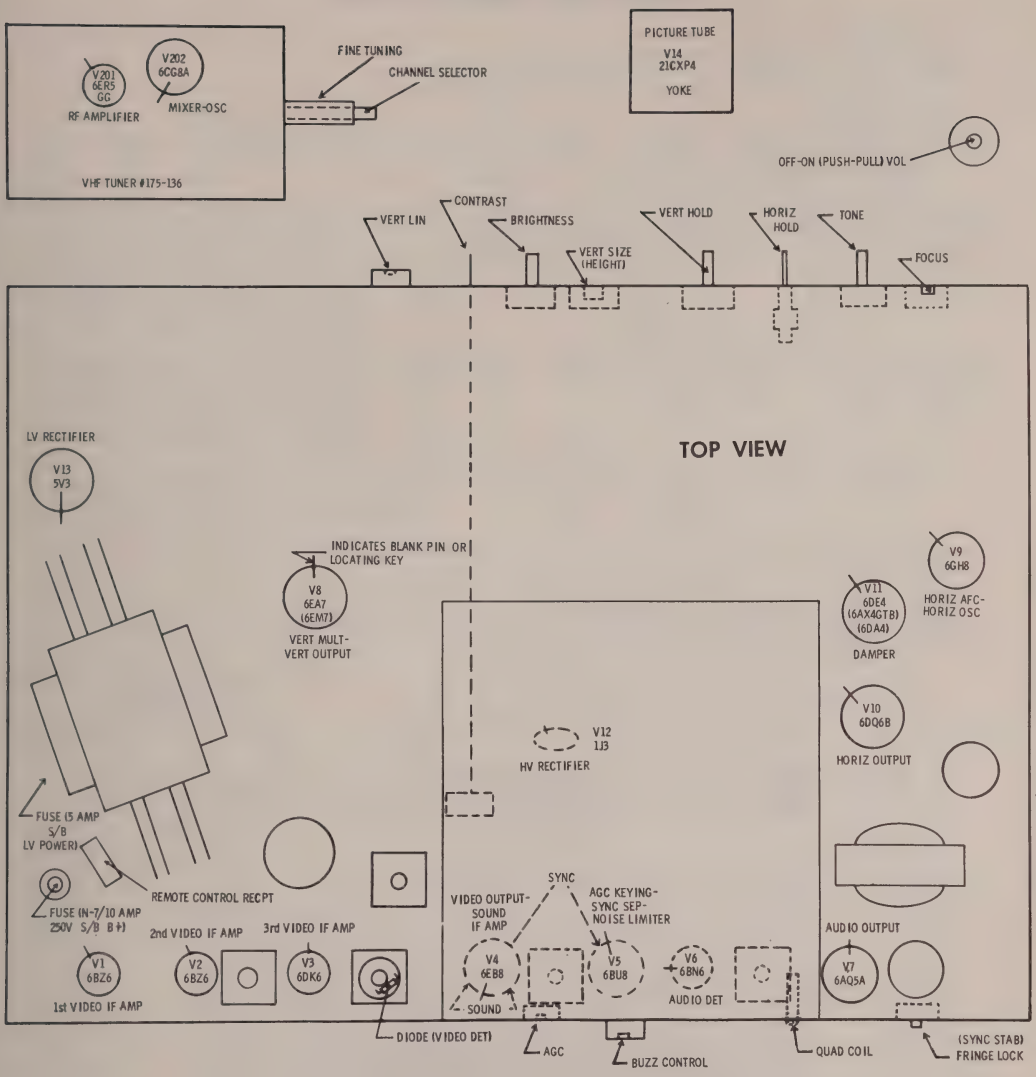
ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573

ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573

FOLDER 2

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound Fuse (LV Power), V13, Fuse (B+), Fuse (Fil.)

SWEEP FAILURE
No raster, has sound V9, V10, V11, V12, V14
No vertical deflection V8
Poor vert. linearity or foldover V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V8
Horiz. off freq. Diode (AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V14
Has pic, no sound V4, V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V5
No horiz. sync V5
No vert. or horiz. sync V5

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: Al thru Al3 ..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru 470mmf to TP-1. Low side to chassis. Connect a 56Ω carbon resistor across sweep output.	44MC (10MC Swp.)	39.75MC 41.25MC 45.75MC	Between any two channels	Vert. Amp. thru 10K to point Ⓐ. Low side to chassis. (Across Video Det. load.)	A1, A2	Set sweep generator output to produce 3 volts peak to peak on scope. Adjust A1 and A2 alternately for maximum gain and symmetry with the 45.75MC marker positioned as shown in Fig. 1. The 39.75MC marker can fall within ±.5MC of the specified frequency. If the desired response cannot be obtained, check to see that the cores are entering their respective windings from opposite ends of the coils.
2.	High side to ungrounded tube shield floating over Mixer-Osc. Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5, A6	Connect a clip lead from point Ⓑ to chassis. Connect a clip lead from point Ⓒ to point Ⓓ. Use high scope gain and adjust A3 thru A6 for MINIMUM marker amplitudes as in Fig.2. A3 controls 39.75MC marker, A4 controls 41.25MC marker, and A5 and A6 control the 47.25MC marker.
3.	"	"	41.25MC 42.75MC 45.0MC 45.75MC	"	"	A7, A8, A9 and Mixer Plate Coil.	Remove clip lead from point Ⓓ and connect to chassis. Adjust for maximum gain and symmetry of response similar to Fig. 3. A7 affects low side of curve and A8 affects the high side. Remove clip leads.

SOUND IF ALIGNMENT

Connect an adjustable attenuator between the antenna and the receiver antenna terminals. Tune in a TV station and adjust the attenuator until the signal is below the limiting level of the Audio Detector as evidenced by a hiss similar to super-regeneration in the sound. Adjust A10, A11, A12 and A13 for maximum sound of best quality. Adjust the Buzz control for MINIMUM buzz. If the hiss disappears during alignment, further reduce the signal level until the hiss returns.

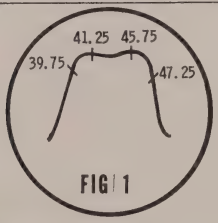


FIG 1

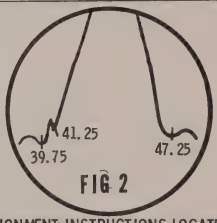


FIG 2

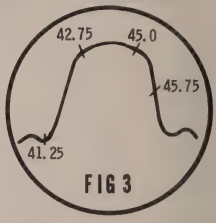
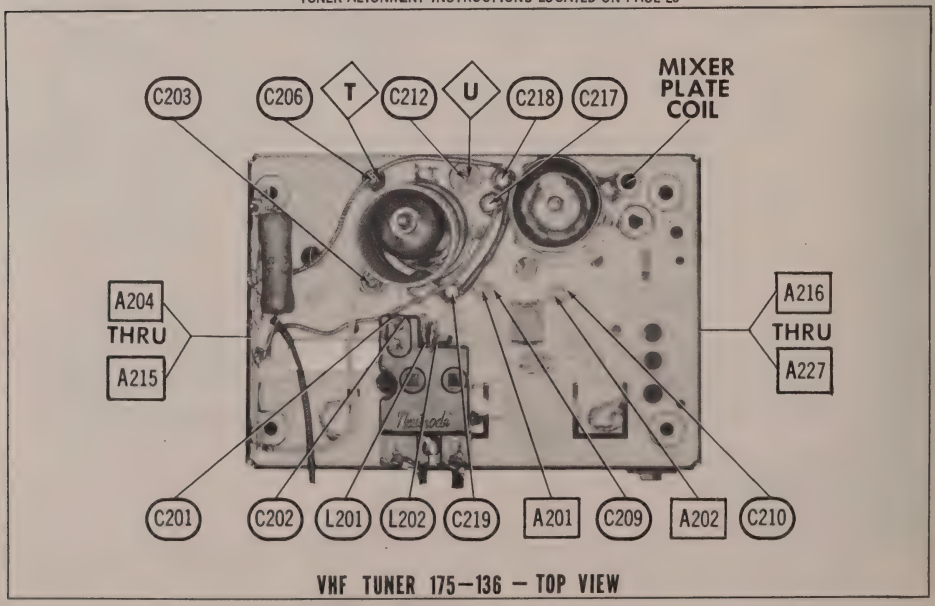
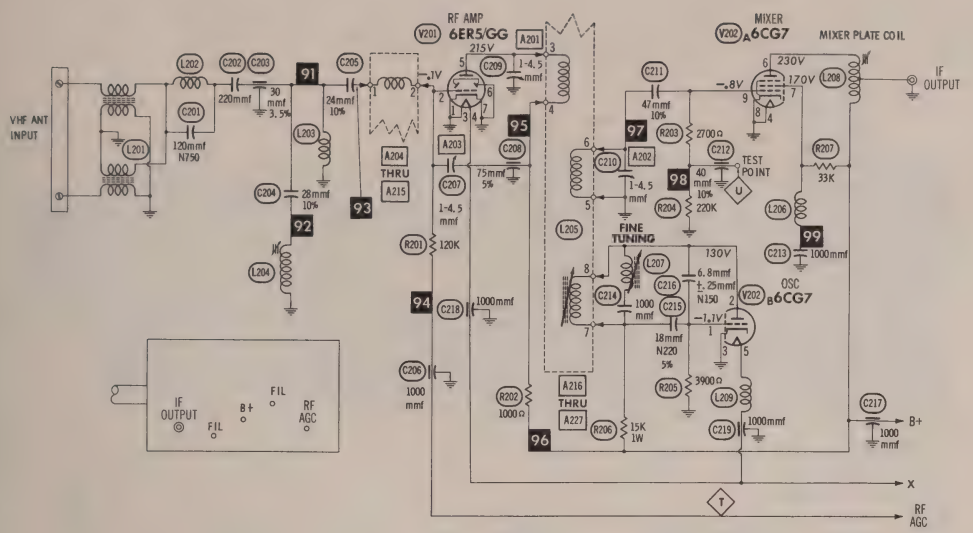


FIG 3

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 20



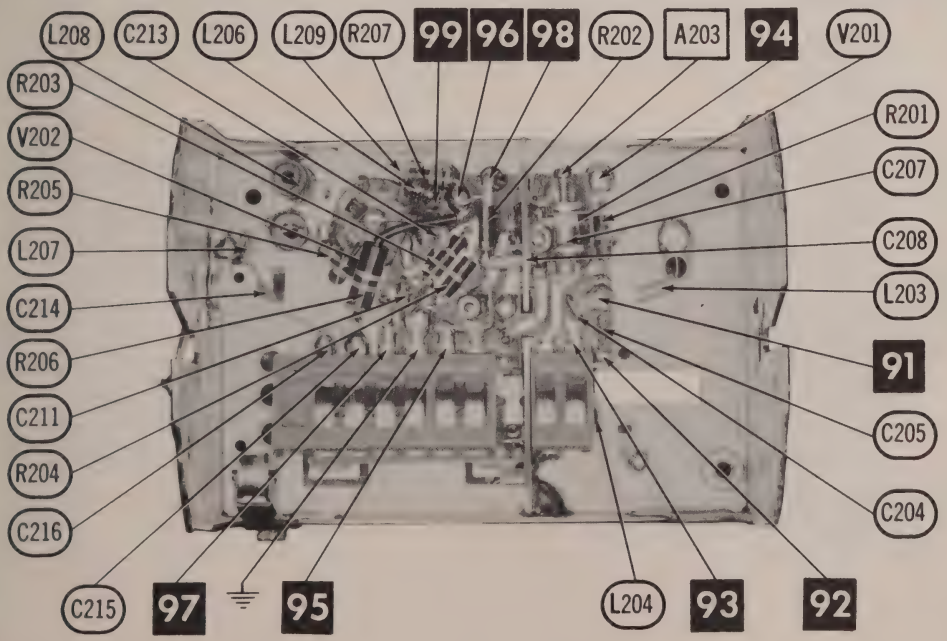
VHF TUNER 175—136 — TOP VIEW



A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE

©Howard W. Sams & Co., Inc. 1960

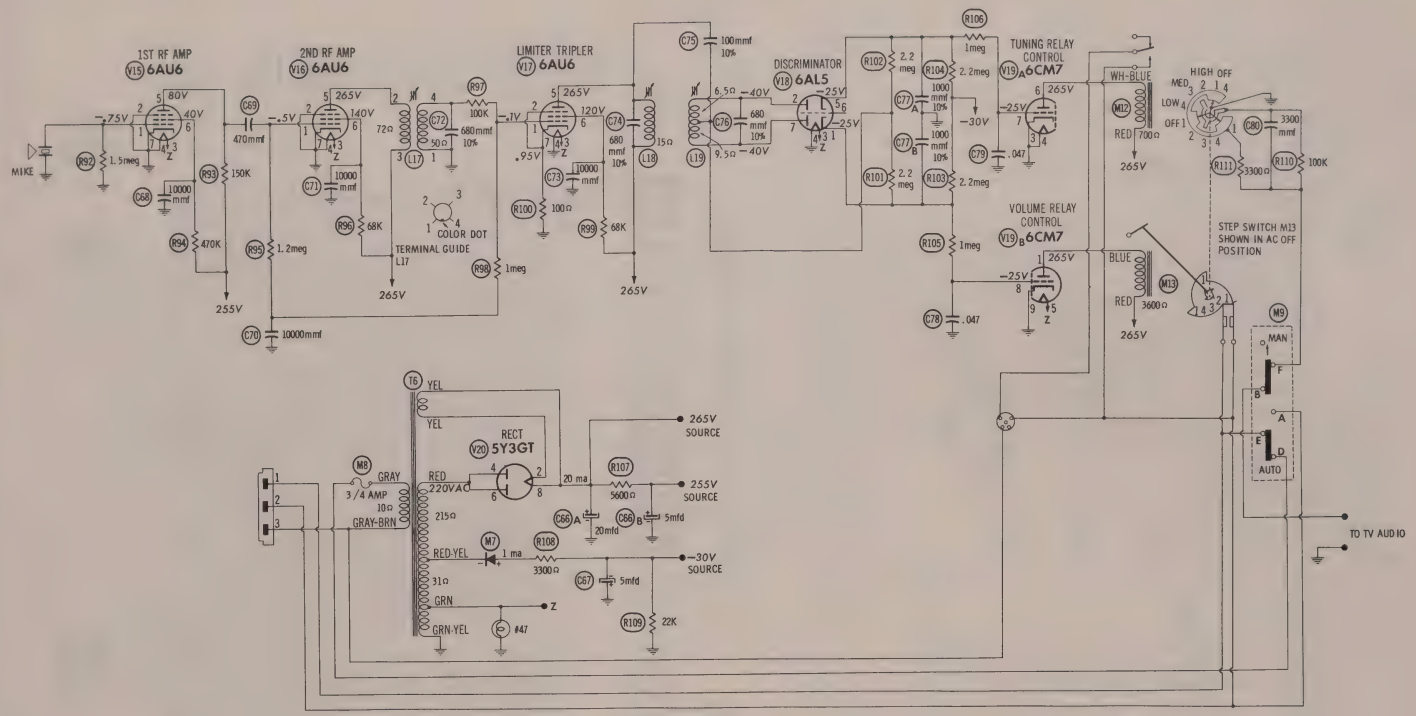
VHF TUNER 175-134, 175-136



A Howard W. Sams CIRCUITRACE Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 175-136 - BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V15	6AU6	1.5meg	0Ω	.1Ω	0Ω	† 155K	† 475K	0Ω		
V16	6AU6	2.3meg	0Ω	.1Ω	0Ω	† 72Ω	† 68K	0Ω		
V17	6AU6	100K	100Ω	.1Ω	0Ω	† 15Ω	† 68K	100Ω		
V18	6AL5	1.8meg	2.2meg	.1Ω	0Ω	1.8meg	NC	2.2meg		
V19	6CM7	† 3600Ω	TP	0Ω	.1Ω	0Ω	† 700Ω	2.7meg	2.7meg	0Ω
V20	5Y3GT	NC	¶	NC	256Ω	NC	256Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V20.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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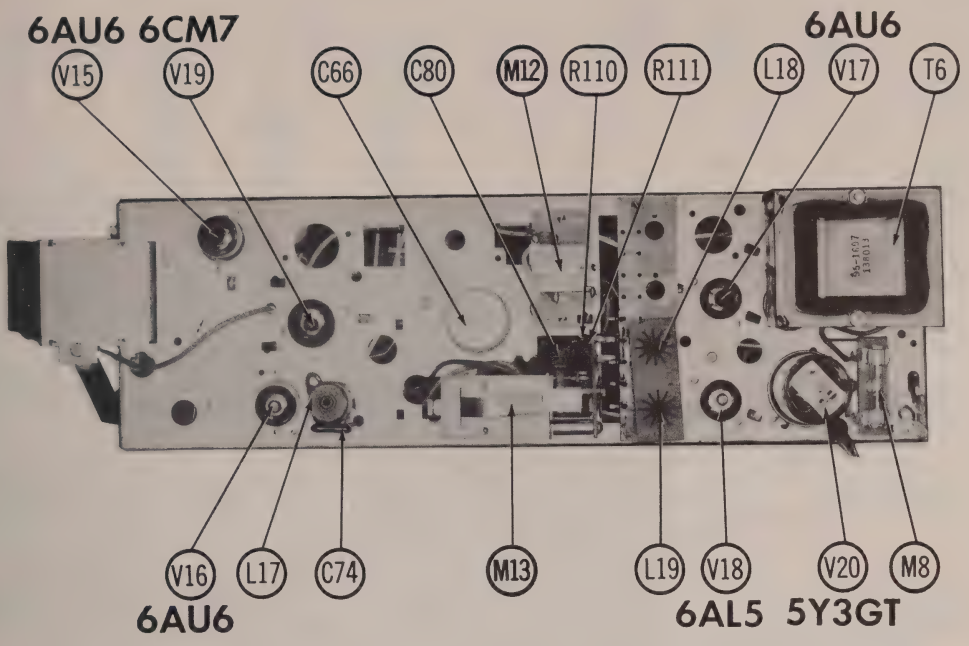
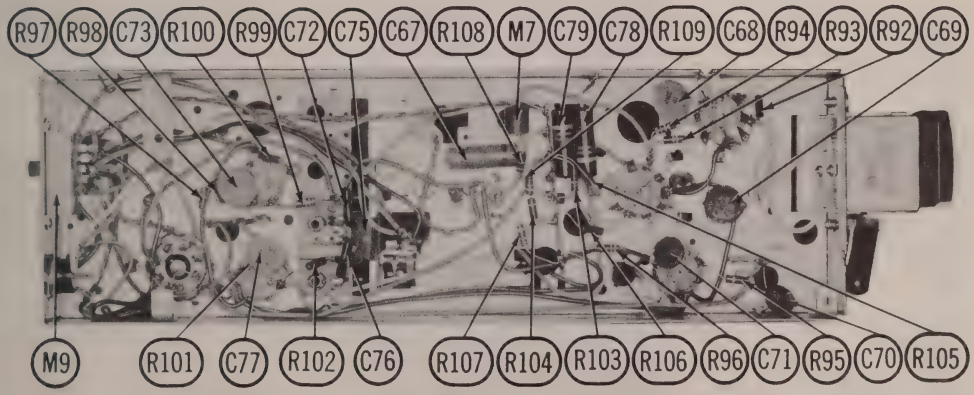
REMOTE CONTROL RECEIVER S-48433, S-48563, S-48573



REMOTE CONTROL RECEIVER S-48573 - TOP VIEW



REMOTE CONTROL RECEIVER S-48573 - BOTTOM VIEW

ZENITH CHASSIS 16E21, Q, U, 5B28,
S-48433, S-48434, S-48563, S-48573

TV CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR, & TRANSFORMER IDENT.

TV CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

ZENITH CHASSIS 16E21, Q, U 5B28,
S-48433, S-48434, S-48563, S-48573

FOLDER 2

TUNER PARTS LIST AND DESCRIPTIONS

175—136

TUBES

• CBS •	GENERAL ELECTRIC •	RAYTHEON •	SYLVANIA •

ITEM No.	USE	TYPE
V201	RF Amp.	6ER5/GG

ITEM No.	USE	TYPE
V202	Mixer - Osc.	6CG8 (6CG8A) *

* Alternate

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N750			TCN-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C202	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C203	30 3.5%	#22-3111						
C204	28 10%			TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C205	24 10%		NPO-DI 25	DTZ-25	C10Q24C	CCTO-240	CNO-425	10TCC-Q25
C206	1000		EF-001	MFT-1000		CCF-102	CT280A	
C207	1-4.5	#22-3148		829-6				
C208	75 5%							
C209	1-4.5	#22-3148		829-6				
C210	1-4.5	#22-3148		829-6				
C211	47 10%		DI-47	DD-470	L10Q47	CCD-470	GP447	10TS-Q47
C212	40 40%	#22-3112						
C213	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	10TS-D10
C215	18 N220 5%	#22-3025				*		10TCR-Q18
C216	6.8 N150 ±.25mmf	#22-3291				*		10TCP-V68
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	

Zenith Part Number

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	120K	
R202	1000Ω	
R203	2700Ω	

ITEM No.	RATING	REMARKS
R204	220K	
R205	3900Ω	
R206	15K 1W	

ITEM No.	RATING	REMARKS
R207	33K	

COILS (RF-IF)

ITEM No.	USE	ZENITH PART No.	NOTES
L201	Ant. Trans.	S-41511	
L202	RF Choke	20-657	
L203	RF Choke	20-756	
L204	Trap Coil	S-40497	
L205A	Ant., RF, Mixer Grid & Osc. Coils	174-2	Channel 2
B	"	174-3	Channel 3
C	"	174-4	Channel 4
D	"	174-5	Channel 5
E	"	174-6	Channel 6
F	"	174-7	Channel 7

ITEM No.	USE	ZENITH PART No.	NOTES
L205G	Ant., RF, Mixer Grid & Osc. Coils	174-8	Channel 8
H	"	174-9	Channel 9
I	"	174-10	Channel 10
J	"	174-11	Channel 11
K	"	174-12	Channel 12
L	"	174-13	Channel 13
L206	RF Choke	20-721	
L207	Fine Tuning Coil	S-43559	Assembly
L208	Mixer Plate Coil	S-45638	
L209	Fil. Choke	20-734	

TV
PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V7	Audio Output	6AQ5A
V2	2nd Video IF Amp.	6BZ6	V8	Vert. Mult. - Vert. Output	6EA7 (6EM7) *
V3	3rd Video IF Amp.	6DK6	V9	Horiz. AFC - Horiz. Osc.	6GH8
V4	Video Output - Sound IF Amp	6EB8	V10	Horiz. Output	6DQ6B
V5	AGC Keying - Sync Sep. - Noise Limiter	6BU8	V11	Damper	6DE4 (6DA4) * (6AX4GTB) *
V6	Audio Detector	6BN6	V12	HV Rectifier	1J3
			V13	LV Rectifier	5V3

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	ZENITH PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V14	21CXP4	21CXP4 ①	21CXP4 ①	21CXP4 ①	21CXP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	400	22-3137	AFHS4-57-93	C0890	FP333.2	TMT-109	TVL-4663.4	
B	■80	400							
C	▲100	50							
C2A	■10	400	22-2744	AFH3-180	C1445	FP368.68	TMT-217	TVL-3655	
B	▲4	350							
C	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.068	200V			P288N-068		CUB4S68	4DP-3-683	GEM-4168	4TM-S68
C4	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C5	4.5	NPO	±.5mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C6	1000		10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C7	12	NPO	5%			TCZ-12	C10Q12C		CNO-412	10TCC-Q12
C8	12	NPO	5%			TCZ-12	C10Q12C		CNO-412	10TCC-Q12
C9	.15	200V			P288N-15		CUB2P15	2DP-3-154	GEM-2015	2TM-P15
C10	1				NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C11	7	NPO	±.5mmf		NPO-DI 6.8		C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C12	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C14	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C15	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C16	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C17	470		10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C18	470		10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C19	5.5	N470	±.5mmf	#22-3221				*		
C20	4.7		10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C21	4.7		10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C22	.033	200V	10%		V84C2S33-10%		PM4S33	4DP-2-333	GEM-1613	6TM-S33
C23	47	N075		#22-2467						
C24	3.3		10%		NPO-SI 3.3	TCZ-3R3	C10V33C	CCTO-3R3	CNO-533	10TCC-V33
C25	50				SI 50	D6-500	L10Q50	CCD-500	GP450	10TS-Q50
C26	27				SI 27	D6-270	L10Q27	CCD-270	GP427	10TS-Q27
C27	50				SI 50	D6-500	L10Q50	CCD-500	GP450	10TS-Q50
C28	10				SI 10	D6-1000	L10Q1	CCD-100	GP410	10TS-Q10
C29	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C30	.22	600V			P688N-22		CUB6P22	6DP-5-224	GEM-6022	6TM-P22
C31	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C32	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	10000		10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C34	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C35	4.3		10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C36A	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
B	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C37	470		10%		1469-00047		5R5T47	CM-19B-471K	MCJ244	MS-347
C38	7.5		10%		NPO-SI 8.2	DD-7R5	L10V8		GP568	10TS-V75
C39	470				BPD-00047	DD-471	5R5T47	CCD-471	B-347	10TS-T47
C40	20	N75		#22-3139						
C41	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C42	2200				BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C43	2200				BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C44	.1	200V			P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C45	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C46	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C47	.0068	200V	10%		V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C48	.022	400V	10%		V84C4S22-10%		PM4S22	4DP-2-223	GEM-1612	6TM-S33
C49	.1	600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C50	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C51	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C52	.015	1000V	10%					16DP-4-153		10TM-S15
C53A	51				DI-50	DD-500	L10Q51	CCD-510	GP450	10TS-Q50
B	51				DI-50	DD-500	L10Q51	CCD-510	GP450	10TS-Q50
C54A	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
B	1000		10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING		REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C56	.047	300V		P385N-047	DD-503	CUR2N7	452P-3-473	GEM-4147	2TM-S47
C56	470			BPD-00047	DD-471	BYA10747	CCD-471	B-347	10TB-T47
C57	680	10%		1469-00068		1N5756	CM-1HB-681K	MC2349	MB-368
C58	3300	10%		1464-00033		1N5033	CM-3HB-332K	MC2483	MB-333
C59	470			BPD-00047	DD-470	BYA10747	CCD-471	B-347	10TB-D33
C60	10000			BPD-01	DD-103	BYA10B	CCD-103	B-110	5HK-B0
C61A	1500			BPD-X00015	DD3-153	HYCSD15A	CCD-152 (CCD-152	B-115	5HK-3X0D5
B	15000			BPD-01	DD-103	BYA10E	CCD-103	B-110	5HK-B0
C62	10	4000V	10%	P488N-1	DF-104	CUB4S1	6DP-4-104	GEM-501	6TM-P1
C63	68	3000V	10%			HVA3DQ68		3DT-468	

Zenith Part Number
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS—IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	43-4061			BU-137	P258L	Volume
B	Shaft					BS8	S-37	
C	Switch					Not Reg.	Not Reg.	Push-Pull, Off-On
R3A	1meg	½	43-4455	A8-06	B47-1meg-S	BU-140	B1-140	Focus
B	Shaft			A8-L	B-70	T344	Not Reg.	
R3A	1meg	½	43-4275	A8-06	A47-1meg-S	Q3-137	Not Reg.	Tone
B	Shaft			Not Reg.	K28-3	Not Reg.	Not Reg.	
R4A	750K	½	43-4277	A8-04	A47-750K-S	QU-138	RU754L	Vert. Hold
B	Shaft			Not Reg.	K28-3	Not Reg.	RL-2500 †	
R5A	1meg	½	43-4620	B-07	A47-1meg-S	QU-141	U87	Vert. Size (Height)
B	Shaft			Not Reg.	K28-3	Not Reg.	Not Reg.	
R6A	350K	½	43-4278	B-50	A47-350K-S	QU-139	U48	Brightness
B	Shaft			Not Reg.	K28-3	Not Reg.	Not Reg.	
R7	90K	½	43-4469					Contrast
	10K Tap							
R8	1000Ω	3(WW)	43-4630	WW-1S2 *	39-1500 *		113-1500 *	Vert. Linearity
	300Ω Slop							
R8A	10K	½	43-4095	AB-14	B47-10K-S	BU-118	BU-118	AGC
B	Shaft			A8-L	Not Reg.	T364	T364	
R10	75kΩ	3(WW)	43-3384	WW-7S1 **	39-800 **		113-800 **	Buzz
	100Ω Slop							
R11A	1meg	½	43-4023		B47-1meg-S		BU-141	Fringe Lock (Sync Hub.)
B	Shaft				Not Reg.		T364	

† Use bushing 46L38.
* Use 3700 Series Resistor.
** Use 1000 Series Resistor.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R12	2.5meg	
R13	3300Ω 1W	
R14	680K	
R15	100Ω	
R16	22K	
R17	22K	
R18	220Ω	
R19	56Ω	
R20	1500Ω	
R21	56K	
R22	56K	
R23	220Ω	
R24	22Ω	
R25	18K	
R26	6800Ω 2W	
R27	1200Ω	
R28	2700Ω	
R29	47K	
R30	330Ω	
R31	39K	
R32	100K	
R33	15Ω	
R34	47K	
R35	15K	
R36	3500Ω 4W	
R37	3900Ω	
R38	120K	

ITEM No.	RATING	REMARKS
R39	1.5meg 1W	
R40	180K	
R41	180K	
R42	470K 1W	
R43	100K	
R44	3.3meg	
R45	330K	
R46	3.3meg	
R47	33K 2W	
R48	680K	
R49	100K	
R50	220K	
R51	820K	
R52	680Ω	
R53	27K 1W	
R54	390K	
R55	1000Ω 1W	
R56	100K	
R57	150K	
R58	82K	
R59	33K	
R60	33K	
R61	56K	
R62	330K	
R63	3.3meg	
R64	2.2meg	
R65	68K	

ITEM No.	RATING	PLUS (OR MINUS)
R66	82K	
R67	1000Ω	
R68	4700 1W	
R69	560Ω	
R70	560Ω	
R71	100K	
R72	330K	
R73	330K	
R74	1meg	
R75	120K	
R76	100K	
R77	100K	
R78	6.8meg	
R79	180K 2W	
R80	47K	
R81	18K	
R83	1meg	
R83	100Ω	
R84	100Ω	
R85	82000Ω 2W	
R86	100Ω	
R87	6.8Ω	
R88	22K 1W	
R89	27K 2W	
R90	330K	
R91	680Ω 1W	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1A	1st Video IF	5-46046 ①						
B	41.25MC Trap							
L2A	39.75MC Trap	5-41893						
B	47.25MC Trap							
L3	2nd Video IF	5-41589						
D	47.25MC Trap							
L4	3rd Video IF	5-46741 ②						
L5	4th Video IF	5-47968 ③						
L6	Series Peaking Coil	5-41879	19-3093	19-3093	TV-1S1	6177	V2-3	90uh
L7	RF Choke	5-42886	19-1004	19-1004	BC-568	6620		8.7uh
L8	Shunt Peaking Coil	5-41619	19-3180	19-3180	TV-184	6180	V2-5	170uh
L8A	4.5MC Trap	5-41538 ④						
B	1st Sound IF							
L10	Shunt Peaking Coil	5-41631	19-3250	19-3250	TV-185	6181	V2-6	250uh
L11	Series Peaking Coil	5-41614 ⑤	19-3180 *	19-3180 *	TV-184 *	6180 *	V2-5 *	170uh
L12	2nd Sound IF	5-43717 ⑥	17-1021 †	17-1021 †	TV-149			
L13	Quadrature Coil	5-47703	30-1005	30-1005	TV-1J1	1680		

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L14	RF Choke	5-42777	19-1005	19-1005	BC-586	6612		10uh

① Alternate Part #5-46045.
② Alternate Part #5-46740.
③ Alternate Part #5-47967 (includes L6).
④ Alternate Part #5-43126
⑤ Wound on 5600Ω Resistor.
⑥ Alternate Part #5-42899.
* Parallel with 5600Ω Resistor.
† Enlarge mounting hole.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	Triad PART No.	NOTES
L15	94Ω		5-45679 ①	HS-7	TV-1S5			HS-7	Tsp ② 35G	

① Alternate Part #5-46676.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE @ CURRENT 1000 ~V	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16	250A	48Ω	1.3 Hy.	95-1681	26C44	C-2996	F-801	C2343 ①	26C44	C-29X

① Drill new mounting hole.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.85A	580VCT @ .390A	5V @ 3.8A	6.3V @ 1.2A	95-1680						R-80BA/BC

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	95-1650	26S75 ①②	A-3033 ③	V34	V036	A-8148 ③	26S75 ①②	A-31X
T3	Vert. Blocks. (13.8MC) (60°) Yoke, (44MA) Rear Conv. & Centering Device,	95-1654 ④	T-2S ③	*MDF-81 ③ ⑤ ⑦	TV37121/47 ③ ⑤ ⑦	PCM2045 ③ ⑤ ⑦	D7-12A ③ ⑤ ⑦	T-2S ③	T-40 & RW3 ③ TC-312
T4	Horiz. Output	84707L		RVD-179					

① Use 8 to 1 Turns Ratio.
② Connect yoke terminal #2 to Horiz. Output Trans. Terminal #4, Yoke #7 to Horiz. Output #2; Connect 10000Ω 1 watt Resistor from Yoke #8 and #9 to Horiz. Output #2.
③ Use original rear cover and centering device and yoke damping capacitor if necessary.
④ Connect Yoke Terminal #9 to Horiz. Output Trans. Terminal #4; Yoke #8 to Horiz. Output #2; Connect 10000Ω 1 watt Resistor from Yoke #8 and #7 to Horiz. Output Terminal #8.
⑤ Cut and form a piece of .062 gauge flat paper inside the yoke itself and support with acetate cement to provide an insulation between width sleeve and the yoke proper.
⑥ Includes C85.
⑦ Cut and tape Green Lead.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	8600Ω	3-4Ω	95-1659R ①	24S04	A-3920	AU-908	A-3850	24S04	S-18Z	① Alternate Part #95-1589

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	QUAM PART No.	NOTES
SP1	5" x 7"	PM	3-4Ω	40-889 ①	5TA2I	① Used in Models S3002E, R, W
	6" x 9"	PM	3-4Ω	40-831 ②	6RA12E.S	② One used in Models S3424E, EU, R, RU, W, WU;
	6" x 9"	PM	3-4Ω	40-831 ③	6IA3	Two used in Models S3424E, SU, R, RU
	10"	PM	3-4Ω	40-832 ④	10AE4	③ One used in Models S3501U, HU, M, MU, R, RU, W, WU
	8"	PM	3-4Ω	40-780 ⑤	8A3	④ One used in Models S3424E, RU
	5" x 7"	PM	8-6Ω	40-953 ⑥	5TA12E.S	⑤ One used in Models S3424E, EU, R, RU, W, WU;
	4"	PM	3-4Ω	40-701 ⑦	5IA1	S3424E, R, W, S3502E
	4"	PM	14-16Ω	40-818 ⑧	4A15Z14	⑥ Two used in Models S3347E, SU, L, LU, M, MU, R, RU,
	3½"	PM	14-16Ω	40-845 ⑨	3A5Y	W, WU, S3007E, M, R, W, One in S3245E, SU, W, WU
				40-907 ⑩		⑦ One used in Models S3002R, Y, S3301R, RU, Y, YU,
				40-843 ⑪		S3302R, RU, S3251L, LU, Y, YU, S3304E, RU, R, RU,
						W, WU
						⑧ One used in Models S3346E, EU, R, RU, W, WU,
						S3302R, RU, M, MU, R, RU, W, WU, S3308R
						⑨ Two used in Models S3344E, SU, R, RU
						⑩ One used in Models S3005Z, M, R, W
						⑪ Two used in Models S3008Z, R, W, Y, S3009E, W, Y

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ZENITH PART No.	REPLACEMENT DATA
K2	Vert. Integrator		87-5	Sprague V-15
A2	Vert. Feedback		87-4	Sprague V-14

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ZENITH PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		103-20 *	SD-81 †	K1615 *			*Dual Selenium Diode Silicon (2 required)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	N	7/10A 250V	136-38		233-750	346010	N 7/10	HN 1/3 to 3/4
M3	3AG	5A 250V 8/5	136-42		N 7/10A 250V 315005 (3AG-5A 250V 8/5)		MDV-5	
M4	1" length (min.) of #24AWG wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ZENITH PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M5		103-23	1N295	1N295	1N295	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M6	Tuner	175-156	VHF Complete, #TANDARD COIL Replacement Type #OG-4220/A Note 1
	Tuner	175-152	VHF Complete, Note 2
	Tuner	175-154	VHF Complete, Note 3
	Tuner	175-151	VHF with UHF Provisions, "U" Models, Note 2
	Tuner	175-153	VHF with UHF Provisions, "U" Models, Note 3
	Tuner	175-9	UHF, "U" Models, Note 2 and Note 3

Note 1. Models S3008R, Y, S3012E, R, W, S3304E, R, W, S3306E, R, W, Y, S3007E, R, M, W, S3308R, S3009E, W, Y
Note 2. Models S3251R, Y, S3012R, S3251L, Y
Note 3. Models S3346E, R, W, S3345E, R, W, S3347E, L, M, R, W, S3348E, R, W, S3302E, M, R, W, S3344E, R

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO	DESCRIPTION
Safety Glass	192-263	Models S3002E, Y
Safety Glass	192-279	Models S3002E, R, W, S3004E, R, W, S3005E, M, R, W, S3006 E, R, W, Y, S3007E, M, R, W, S3008E, S3009E, W, Y, S3251L, Y, S3346E, R, W, S3347E, L, M, R, W, S3348E, R, W, S3344E, R
Safety Glass	192-285	Models S3302R, S3345E, R, W, S3346E, R, W, S3302E, R
Safety Glass	192-284	Models S3301Y
Safety Glass	192-282	Models S3302E, M, R, W
Knob	46-231	Channel Selector, Models S3345E, R
Knob	5-47430	Channel Selector, Models S3003R, Y, S3003E, R, W, S3004E, R, W, S3005E, M, R, W, S3006E, R, W, Y, S3007E, M, R, W, S3008R, S3009E, W, Y
Knob	46-2273	Channel Selector, Models S3302R, S3302E, S3346E, R, W
Knob	46-2160	Channel Selector, Models S3301Y, S3251L, Y
Knob	46-2271	Channel Selector, Models S3345E, R, W, S3346E, R, W, S3347E, L, M, R, W, S3348E, R, W, S3302E, M, R, W
Knob	46-3035	Fine Tuning, All 3000 Series
Knob	5-46280	Fine Tuning, All 3000 Series (Except Models S3345E, R)
Knob	5-49430	Models S3345E, R
Knob	5-46733	UHF Dial, All "U" Models (Except Models S3345E, R)
Knob	5-43528	UHF Dial, Models S3345E, R
Knob	5-45705	Volume, Models S3302R, Y, S3302E, S3251L, YU, S3345U, RU, WU, S3345E, R, W, S3346E, R, W, S3347EU, LU, MU, RU, WU, S3348EU, RU, WU, S3302E, Y
Knob	5-46725	Volume, Models S3251L, Y, S3346E, R, W, S3347E, L, M, R, W, S3348E, R, W, S3302E, M, R, W, S3303E, R, W, S3304E, R, W, S3305E, M, R, W, S3306E, R, W, Y, S3307E, M, R, W, S3008R, S3009E, W, Y, S3344E, R, W, S3345E, R, W, S3302E, M, R, W, S3008R, Y
Knob	46-3305	Brightness, Vertical Hold, Tone, Models S3302R, Y, S3302E, S3346E, R, W, S3345E, R, W, S3302E, M, R, W, S3008R, Y
Knob	5-41483	Tone, Two used in Models S3344E, R
Knob	46-4734	Contrast, Models S3302R, Y, S3302E, S3345E, R, W, S3346E, R, W, S3302E, M, R, W, S3008R, Y
Knob	5-46734	Contrast, Models S3302E, R, W, S3305E, M, R, W, S3307E, M, R, W, S3251L, Y, S3346E, R, W, S3347E, L, M, R, W, S3348E, R, W
Knob	5-49431	Contrast, Models S3004E, R, W, S3302E, M, R, W, Y, S3008E, S3009E, W, Y, S3346E, R, W, S3348E, R
Knob	76-1025	Horizontal Hold, Models S3302R, Y, S3302E, R, W, S3345E, R, W, S3302E, M, R, W, S3008R, Y

TV PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS (cont)

NAME	PART NO.	DESCRIPTION
Knob	46-1118	Horizontal Hold, Models E2315L, Y, E2316E, R, W, E2347E, L, M, R, W, E2348E, R, W, E3002E, R, W, E3004E, R, W, E3005E, M, R, W, E3006E, R, W, Y, E3007E, M, R, W, E3008R, E3009E, W, Y, E2384H, R
Cabinet	14-2721	Model E2301R
Cabinet	14-2722	Model E2301Y
Cabinet	14-2726	Model E2302R
Cabinet	14-2696	Model E2315L
Cabinet	14-2691	Model E2315Y
Cabinet	14-2694	Model E2316E
Cabinet	14-2693	Model E2316R
Cabinet	14-2695	Model E2316W
Cabinet	14-3003	Model E2345E
Cabinet	14-3002	Model E2345R
Cabinet	14-3001	Model E2345W
Cabinet	14-3006	Model E2346E
Cabinet	14-3005	Model E2346R
Cabinet	14-3004	Model E2346W
Cabinet	14-3009	Model E2347E
Cabinet	14-3010	Model E2347L
Cabinet	14-3011	Model E2347M
Cabinet	14-3008	Model E2347R
Cabinet	14-3007	Model E2347W
Cabinet	14-3014	Model E2348E
Cabinet	14-3013	Model E2348R
Cabinet	14-3012	Model E2348W
Cabinet	14-3018	Model E2350H
Cabinet	14-3015	Model E2350M
Cabinet	14-3016	Model E2350R
Cabinet	14-3017	Model E2350W
Cabinet	14-3019	Model E2384R
Cabinet	14-3020	Model E2384H
Cabinet	14-2721	Model E3000R
Cabinet	14-2722	Model E3000Y
Cabinet	14-2694	Model E3002E
Cabinet	14-2693	Model E3002R
Cabinet	14-2695	Model E3002W
Cabinet	14-3035	Model E3004E
Cabinet	14-3034	Model E3004R
Cabinet	14-3033	Model E3004W
Cabinet	14-3038	Model E3005E
Cabinet	14-3039	Model E3005M
Cabinet	14-3037	Model E3005R
Cabinet	14-3036	Model E3005W
Cabinet	14-3042	Model E3006E
Cabinet	14-3041	Model E3006R
Cabinet	14-3040	Model E3006W
Cabinet	14-3043	Model E3006Y
Cabinet	14-3046	Model E3007E
Cabinet	14-3047	Model E3007M
Cabinet	14-3045	Model E3007R
Cabinet	14-3044	Model E3007W
Cabinet	14-3048	Model E3008R
Cabinet	14-3059	Model E3009E
Cabinet	14-3053	Model E3009W
Cabinet	14-3065	Model E3009Y

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V15	1st RF Amp.	6AU6	V18	Discriminator	6AL5
V16	2nd RF Amp.	6AU6	V19	Tuning - Vol. Relay Control	6CM7
V17	Limiter - Tripler	6AU6	V20	Rectifier	5Y3GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C66A	■20	350	22-3122	AFH2-50	B0390	FP231.3	TMD-35	TVL-2754	
B	▲5	350							
C67	5	50	22-2941	PRS1310	BBR5-50	TC30	TD-5-50	TVA-1303	

REMOTE CONTROL RECEIVER PARTS LIST (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C68	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C69	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C70	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C71	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C72	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C73	10000		BPD-01	DD-103	BYA10S1	CCD-103		5HK-S10
C74	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C75	100 10%		1469-0001	TCZ-101	22R5T1	CM-19B-101K	MCB235	MS-310
C76	680 10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C77A	1000 10%		DI-1000	DD-103	PM6D1	CCD-102	GP210	10TS-D10
B	1000 10%		DI-1000	DD-103	PM6D1	CCD-102	GP210	10TS-D10
C78	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C79	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C80	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R92	1.5meg	
R93	150K	
R94	470K	
R95	1.2meg	
R96	68K	
R97	100K	
R98	1meg	

ITEM No.	RATING	REMARKS
R99	68K	
R100	100Ω	
R101	2.2meg	
R102	2.2meg	
R103	2.2meg	
R104	2.2meg	
R105	1meg	

ITEM No.	RATING	REMARKS
R106	1meg	
R107	5600Ω	
R108	3300Ω	
R109	22K	
R110	100K	
R111	3300Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ZENITH PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L17	39.5KC IF Trans.	S-43725						
L18	Discriminator Prim.	S-24788						
L19	Discriminator Sec.	S-24789						

TRANSFORMER (POWER)

ITEM No.	RATING		REPLACEMENT DATA						
	PRI.	SEC. 1	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T6	117V @ .32A	220V @ .020A Tap @ 33V @ .001A Tap @ 6.3V @ 1.9A	95-1697						
	SEC. 2								
	5V @ 2A								

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	ZENITH PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M7	.001A	212-21 ♦			12		♦ Selenium

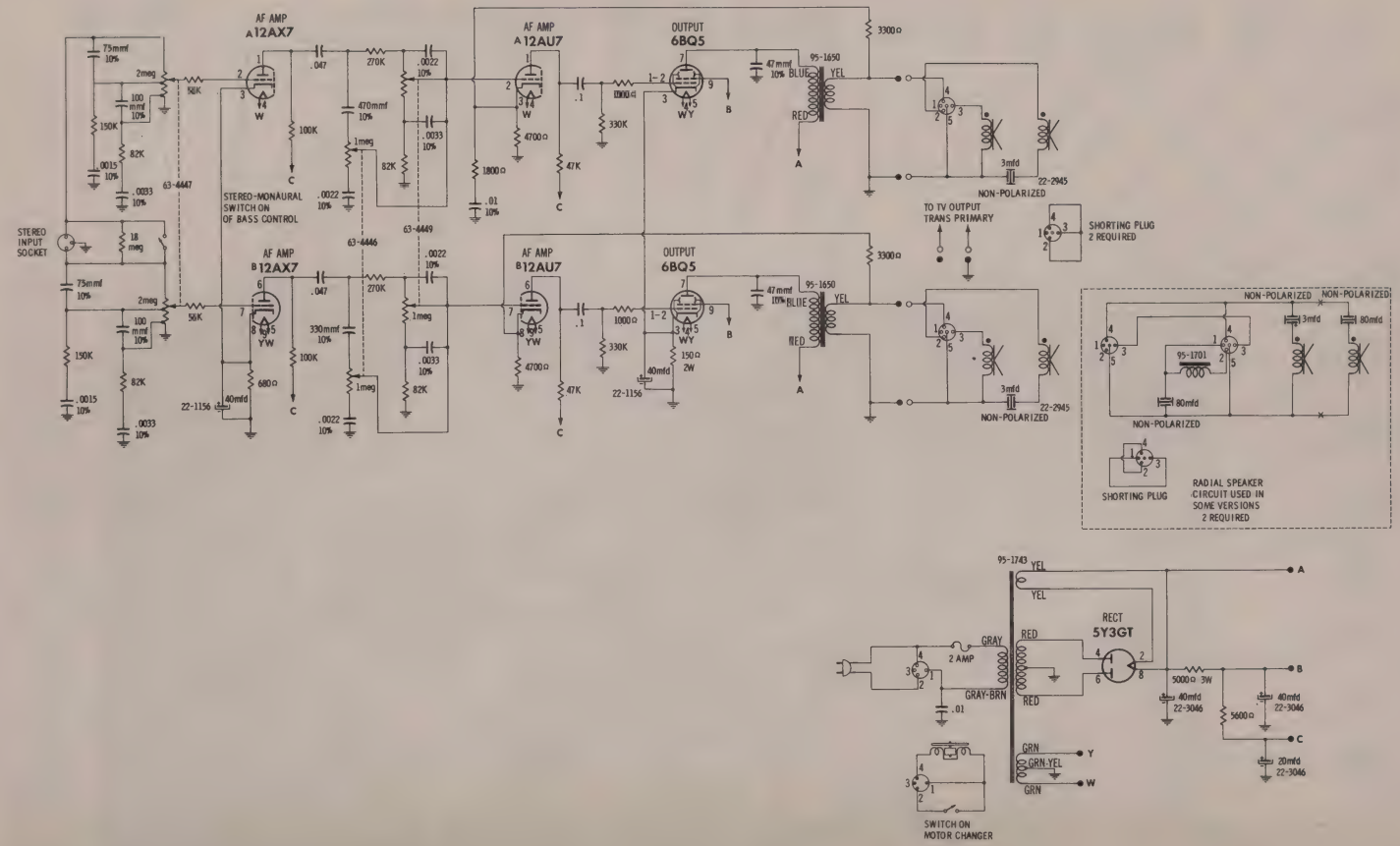
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M8	3AG	3/4A 250V	136-41		312.750 (3AG 3/4A 250V)	356001	MDL 3/4	4406

POWER TUNING
PARTS LIST AND DESCRIPTIONS

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M9	Switch	85-580	Auto - Manual, DPDT Slide Type
M10	Switch	S-43732	Motor Drive Ass'y, Includes Motor Part #141-153 and Motor Switch Ass'y Part #S-41498
M11	Switch	S-44018	Channel Selector
M12	Relay	195-5	C. W.
M13	Relay	S-48660	Step (Includes Step Switch)



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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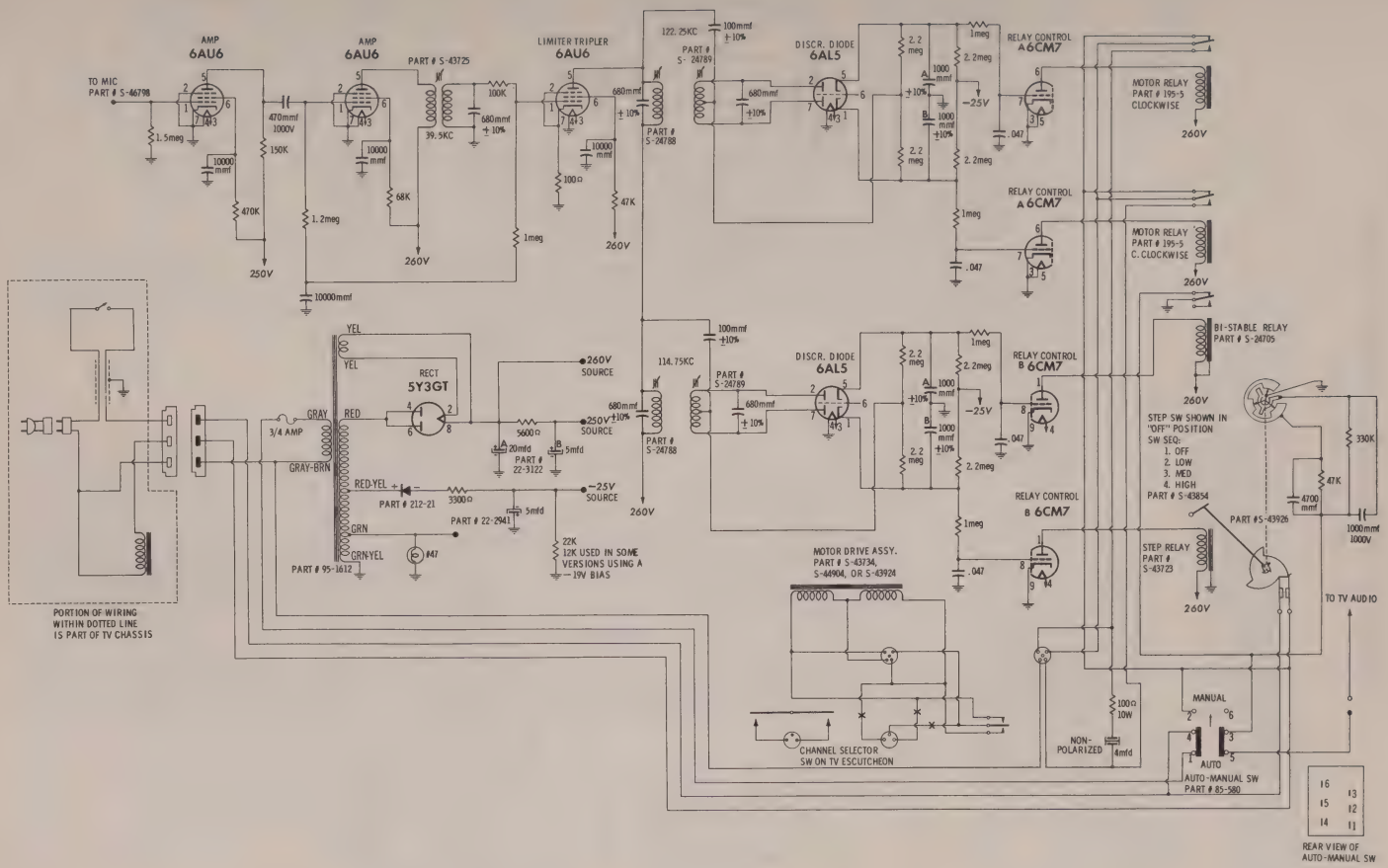
AUDIO AMPLIFIER 5B28



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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REMOTE CONTROL RECEIVER S-48434

ZENITH CHASSIS 16E21, Q, U, 5B28, S-48433, S-48434, S-48563, S-48573

TUNER ALIGNMENT INSTRUCTIONS

175-134, 175-136

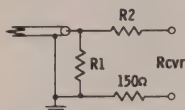
PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A203 ... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525
A216 thru A227 ... GENERAL CEMENT #8607, 9291
WALSCO #2520, 2522, 2523, 2524, 2537

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru matching transformer (Fig. 201).	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202, A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	



Zo = Impedance of Cable

Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 201

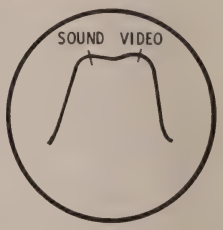


FIG. 202

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Fig. 201	Across antenna terminals thru matching transformer (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Detector load.	A216	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

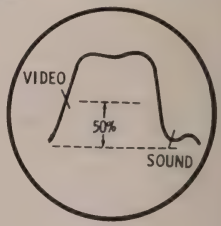
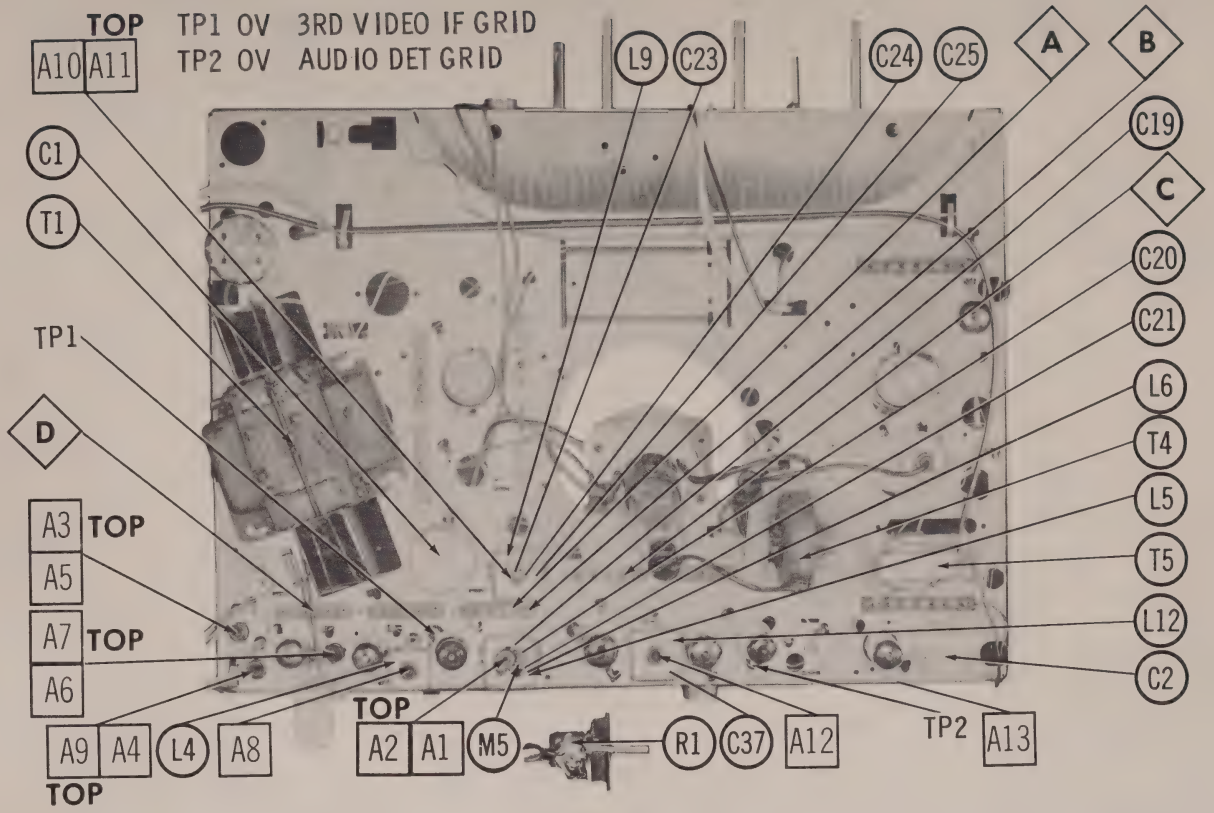


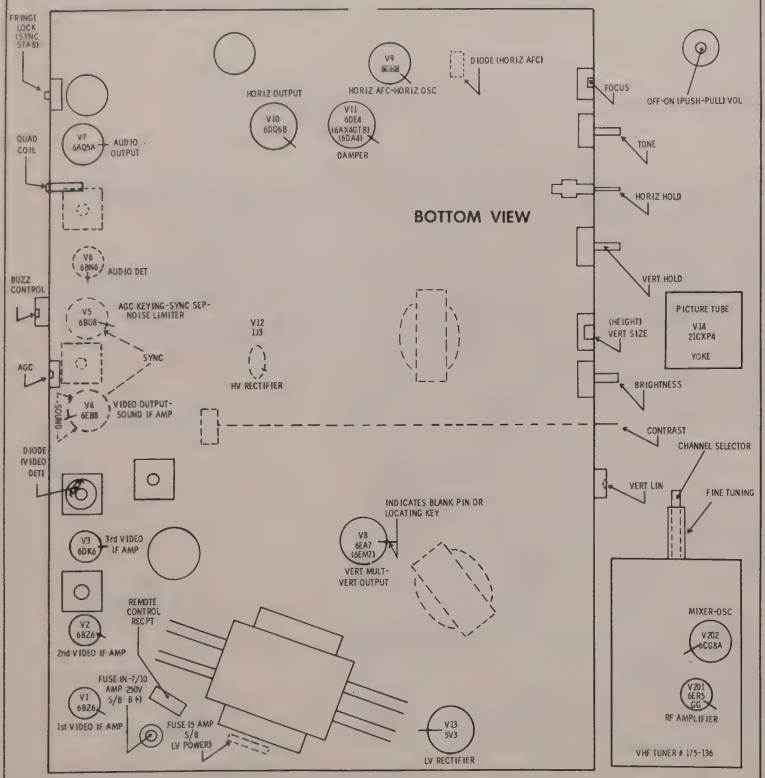
FIG. 203



TV CHASSIS - TOP VIEW

ZENITH CHASSIS 16E21, Q, U, 5B28,
S-48433, S-48434, S-48563, S-48573

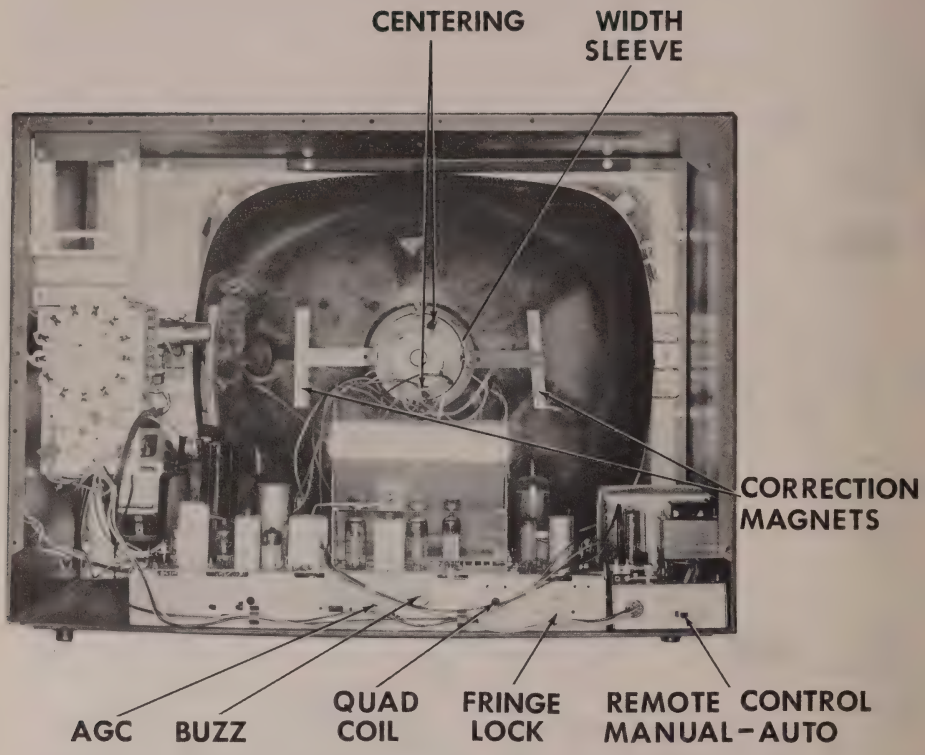
TUBE PLACEMENT CHART



RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1.3meg	1550Ω	.2Ω	0Ω	▲240Ω	▲240Ω	1500Ω		
V2	6BZ6	40K	▲22Ω	.2Ω	0Ω	†270Ω	†270Ω	INF		
V3	6DK6	.1Ω	120Ω	.2Ω	0Ω	†8200Ω	†8200Ω	0Ω		
V4	6EB8	0Ω	100K	†440K	.2Ω	0Ω	15Ω	3000Ω	†27K	†6500Ω
V5	6BU8	● 8000Ω	†22K	690K	.2Ω	0Ω	†130K	†350K	†80K	†8.3meg
V6	6BN6	● 280Ω	.2Ω	.2Ω	0Ω	†27K	3.7Ω	†390K		
V7	6AQ5A	0Ω	680Ω	.2Ω	0Ω	†1800Ω	†1000Ω	0Ω		
V8	6EA7	2.2meg	†400Ω	● 1400Ω	● 700K	†●4.2meg	0Ω	0Ω	.2Ω	
V9	6GH8	†100K	100K	†47K	0Ω	.2Ω	†120K	26Ω	0Ω	1.5meg
V10	6DQ6B	TP	.2Ω	TP	†8300Ω	1meg	NC	0Ω	0Ω	TOP CAP †8.7Ω
V11	6DE4	NC	NC	¶1.2meg	0Ω	†49Ω	NC	0Ω	.2Ω	
V12	1J3		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP †285Ω
V13	5V3	NC	¶	TP	26Ω	NC	29Ω	TP	¶	
V14	21CXP4	.2Ω	0Ω	Pin 6 †●1.8meg	Pin 10 †330K	Pin 11 ●150K	Pin 12 0Ω			
V201	6ER5/GG	0Ω	3meg	0Ω	.2Ω	†4300Ω	0Ω	0Ω		
V202	6CG8A	3900Ω	†18K	0Ω	0Ω	.2Ω	†3300Ω	†36K	0Ω	220K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM PIN 8 OF V13.
† MEASURED FROM PIN 3 OF V11.
NC NO CONNECTION
TP TIE POINT



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

The Horizontal Hold is equipped with a stop which limits rotation to approximately 270° with the knob on the shaft. To adjust, remove the knob and adjust by turning the shaft until the picture is synchronized to the point where it is virtually impossible to disrupt horizontal synchronization when switching from channel to channel. Install the knob with its pointer centered between the stops.

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove TV Chassis (See "Chassis Removal"). Remove 11 screws holding mask inside of cabinet. Tilt glass back and remove.

FUSE

TV: A 5 Amp. line fuse and a 7/10 Amp. (B+) fuse are used for receiver protection. (See "Tube Placement Chart" for location.)
A fuse wire is used for filament protection. (For location, see M4 in photo "Chassis - Bottom View".)

Remote Control Receiver: A 3/4 Amp. fuse is used for receiver protection. (For location, see "Chassis - Top View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch up VHF Oscillator, remove knobs and trim plate.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus Control. (See "Tube Placement Chart" for location.)

SYNC STABILITY

Sync stability may be varied by means of a Fringe Lock Control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

WIDTH

The width may be varied by adjusting a metallic sleeve, located between the yoke and the picture tube neck, in or out of the yoke.

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Buzz Control for MINIMUM buzz and maximum sound. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

PINCUSHION CORRECTION

Reduce the picture size so that the sides of the raster are visible. Position the magnets so that all sides are straight.

PHOTOFACT® Folder

PRODUCTION CHANGE BULLETIN 242

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 445

	Motorola Models Y17P5-1, Y17P5-2, Y17T32BZ, 17P5-1, 17P5-2, 17T32BZ, 17T33B, M (Ch. LTS-430, TS-430, Y) were covered in PHOTOFACT Folder 1 - Set 445. Models Y17P5-3A, Y17P5-4A, Y17P5-5A, Y17T32BZD, 17T32BZD, 17T33BD, W, WD (Ch. LTS-430, QTS-430Y, RTS-430) are added along with late production changes with the publication of this bulletin.
Chassis Coding B-03	TO IMPROVE SENSITIVITY ON CHANNELS 2 and 3 An 18mmf capacitor is added from the junction of L3A and R8 to ground.
Chassis Coding B-04	TO ELIMINATE MICROPHONIC AUDIO HOWL C45 is relocated to the outside of L17. L17 is changed to Part #24K751880.
Chassis Coding B-05	DESIGN CHANGE The high voltage rectifier socket is rewired to accept either a Type 1S2A or a Type 1AG2 high voltage rectifier tube. R84 is relocated from between pins 3 and 9 to between pins 4 and 7. The anode lead is relocated from pin 3 to pin 7. The high voltage wire, connected to pins 7 and 8, is connected to pins 3 and 5. R85 is relocated from between pins 7 and 9 to between pins 1 and 3.
Chassis Coding C-00	TO IMPROVE VERTICAL SYNC C51 is decreased from 470mmf to 330mmf. R47 is increased from 2.2meg to 12meg; this resistor is removed from ground and connected to the 260V source. TO ELIMINATE LIGHT AND DARK VERTICAL BARS IN THE RASTER A 120Ω resistor is added in series with the already added .002 capacitor from pin 4 of V11 (12DQ6A) to terminal 1 of the horizontal output transformer. TO IMPROVE AUDIO The audio take-off point is relocated from the input of the video output to the plate. C6, C7 are deleted. L2 is deleted. ----Correction Notice----On the original schematic L2 and L3B are transposed. L14 is replaced with a 3.9mmf capacitor. R37 is deleted. With this change pin 3 of V6A (5U8) is connected to lug 3 of L16. R39 is decreased from 22K to 18K. R40 is decreased from 18K to 15K.

MOTOROLA MODELS Y17P5-3A, Y17P5-4A, Y17P5-5A, Y17T32BZD, 17T32BZD, 17T33BD, W, WD (CH. LTS-430, QTS-430Y, RTS-430)

PRODUCTION CHANGE BULLETIN 242

PRODUCTION CHANGE BULLETIN 242

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

	A100K ½ watt resistor is added from pin 2 of V6A (5U8) to ground. L15 is replaced with a new audio take-off coil (Part #24K746552). A 47mmf capacitor is added from pin 2 of V6A (5U8) to the sound take-off coupling capacitor (3.9mmf). A 15mmf capacitor is added from the junction of the 47mmf capacitor and the 3.9mmf capacitor to ground. The audio take-off coil is connected in the circuit from the junction of the 47mmf capacitor and the 3.9mmf capacitor to ground. C37 is deleted. C40 is deleted. L16 changed to Part #24B747199. C39 is decreased from 5000mmf to 1800mmf. L10 is decreased from 330 microhenries to 180 microhenries Part #24K749674. L12 is changed from 240 microhenries (5600Ω) to 270 microhenries (2700Ω).
Chassis Coding C-01	RELIABILITY CHANGE The damper tube socket is changed from a wafer type to a moulded type in order to reduce the possibility of voltage breakdown between the pins.
Chassis Coding C-02	DESIGN CHANGE C85 is deleted. R88 (Video Output Screen) is connected to the junction of M1 and L21 instead of the 260 volt source. TO IMPROVE TEMPERATURE CHARACTERISTICS C43 is changed from 18mmf N150 to 18mmf N330.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	61K747395	Models Y17P5-3A, -4A, -5A, Y17T32BZD, 17T32BZD
Safety Glass	61K747457	Models 17T32BD, W, WD
Bezel	13K751087	Models Y17P5-3A, -4A
Bezel	13K749288	Model Y17P5-5A
Bezel	13K747407	Models Y17T32BZD, 17T32BZD
Mask	13D747449	Models 17T33BD, W, WD
Knob	36K748579	Channel Selector, Models Y17P5-3A, -4A, -5A, Y17T32BZD
Knob	36K748580	Channel Selector, Models 17T32BZD, 17T33BD, WD
Knob	36C746582	Channel Selector, Model 17T32W
Knob	36C738680	Fine Tuning, Models Y17P5-3A, -4A, -5A, Y17T32BZD, 17T32BZD, 17T33BD, W, WD
Knob	36K747405	Off-On Volume, Models Y17P5-3A, -4A, -5A, Y17T32BZD, 17T32BZD, 17T33BD, W, WD
Knob	36B747402	Brightness, Models Y17P5-3A, -4A, -5A, Y17T32BZD, 17T32BZD, 17T33BD, W, WD
Knob	36K747404	Contrast, Models Y17P5-3A, -4A, -5A, Y17T32BZD, 17T33BD, W, WD
Knob	36K747403	Vert. Hold, Models Y17P5-3A, -4A, -5A, Y17T32BZD, 17T32BZD, 17T33BD, W, WD
Scale	34K746597	UHF Dial, Models Y17P5-3A, -4A, -5A, Y17T32BZD
Cabinet	16K751085	Model Y17P5-3A
Cabinet	16K751086	Model Y17P5-4A
Cabinet	16K749287	Model Y17P5-5A
Cabinet	16F747409	Models Y17T32BZD, 17T32BZD
Cabinet	16K747605	Model 17T33W
Swivel Base Ass'y	16K747607	Model 17T33BD
Swivel Base Ass'y	16K747608	Models 17T33W, WD

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 373

GENERAL ELECTRIC MODELS C405B, C, D, C406B, C407C, D

General Electric Models C405, C406, 935, 936 were covered in PHOTOFACT Folder 6 - Set 373.

Models C405B, C, D, C406B, C407C, D are added along with late production changes with the publication of this bulletin.

COMPONENT CHANGES

L1 (Loopstick Antenna) is changed to Part #RS-1491.

L2 (Osc. Coil) is changed to Part #RS-1523.

L3 (Input IF) is changed to Part #RS-1415.

L4 (Output IF) is changed to Part #RS-1415.

M1 (Tuning Cap.) is changed to Part #RS-1524.

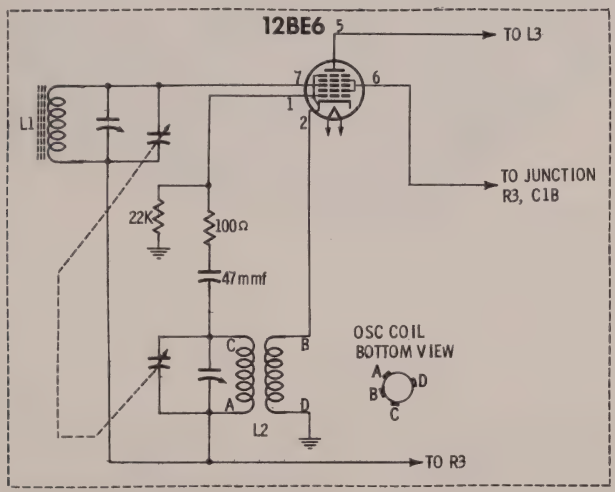
SPEAKER CHANGE

SP1 (Speaker) is changed to Part #RB-1057.

TUBE CHANGE

V1 (Converter Tube) is changed from a Type 12AU6 to a Type 12BE6. A partial schematic diagram showing the changes in the oscillator circuit is given below in this bulletin.

(Continued On The Reverse Side)



SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 15 IN SET 467

PONTIAC MODEL 989613

Pontiac Model 988978 was covered in PHOTOFACT Folder 15 - Set 467.

Model 989613 is electrically similar except for the following changes.

CIRCUIT CHANGE

The wire going from the Off-On Switch to the Antenna Relay is removed.

SPEAKER CHANGE

SP1 (4" x 10" speaker) is changed to Part #7275766.

TRANSFORMER CHANGE

T3 (Audio Output Transformer) is changed to Part #1221428.

(Continued On The Reverse Side)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	RS-2040	Volume, Clear and Gold
Knob	RS-1095	Tuning, Clear
Knob	RS-1096	Clock, Models C405B, C406B
Knob	RS-2200	Clock, Models C405C, D, C407C, D
Cabinet (Front)	RB-1004	White (Includes Dial), Models C405B, C, D, C407C, D
Cabinet (Front)	RB-1022	Pink (Includes Dial), Model C406B
Cabinet (Back)	RB-1005	Gray, Models C405B, C, D
Cabinet (Back)	RB-1006	Pink, Model C406B
Cabinet (Back)	RB-1134	Rose Beige, Models C407C, D
Dial	RS-1166	

CABINETS & CABINET PARTS

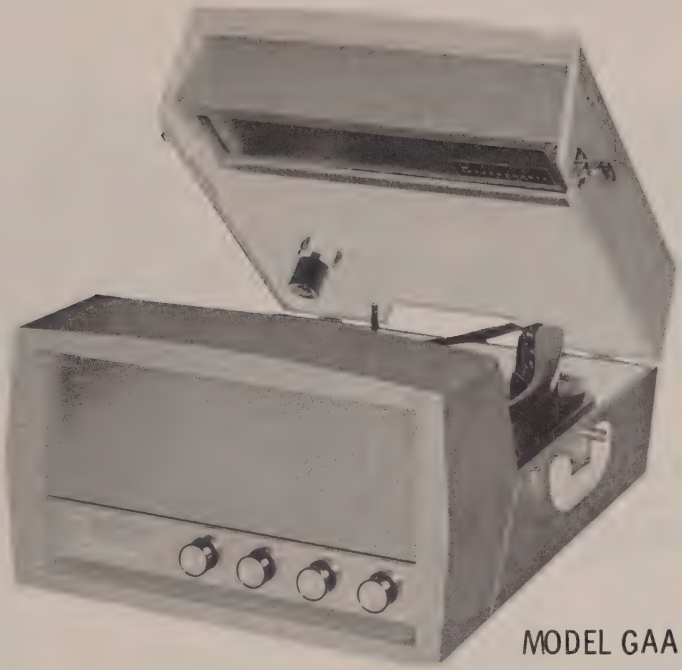
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	536278	Tone (Bonneville and Star Chief)
Knob	536196	Control
Knob	536108	Dummy (Bonneville and Star Chief)
Pushbutton Ass'y	1221459	Includes Front Bearing Plate and Slides
Pushbutton	7275218	

PHOTOFACT® Folder

AIRLINE MODELS GAA-1019A, B, GAA-2691A, GAA-2692A, GAA-2693A

AIRLINE MODELS GAA-1019A, B, GAA-2691A, GAA-2692A, GAA-2693A



MODEL GAA-1019B

AIRLINE MODELS GAA-1019A, B, GAA-2691A, GAA-2692A, GAA-2693A

TRADE NAME	Airline Models GAA-1019A, GAA-1019B, GAA-2691A, GAA-2692A, GAA-2693A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago 7, Illinois
TYPE SET	AC Operated 5 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 51 Watts, .51 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18
OR RECORD CHANGER MANUAL RC-12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp.	6AU6
V2	Channel 1 Output	6BQ5
V3	Channel 2 AF Amp.	6AU6
V4	Channel 2 Output	6BQ5
V5	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	350	1020	AFH3-43	C0340	FP376.8	TMT-150	TVL-3785	
B	■40	350							
C	▲10	350							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C3	.0033 600V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C4	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C5	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C6	.0033 600V		P688N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C7	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C8	.5 100V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5
C9	.5 100V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5meg		438	B-88			FA56A	Loudness, Channel 2
B	5meg			SR-88			RU56A	Loudness, Channel 1
C	Shaft			Not Req.			CS3500	
R2A	500K		436	B-60				Balance, Channel 1
B	500K			SR-613				Balance, Channel 2
R3A	2meg		437	B-76			FA26A	Treble, Channel 2
B	2meg			SR-76			RU26A	Treble, Channel 1
C	Shaft			Not Req.			CS3500	
R4A	5meg		439	B-87			FA56L	Bass, Channel 2
B	5meg			SR-87			RU56L	Bass, Channel 1
C	Shaft			Not Req.			CS3500	

RESISTORS

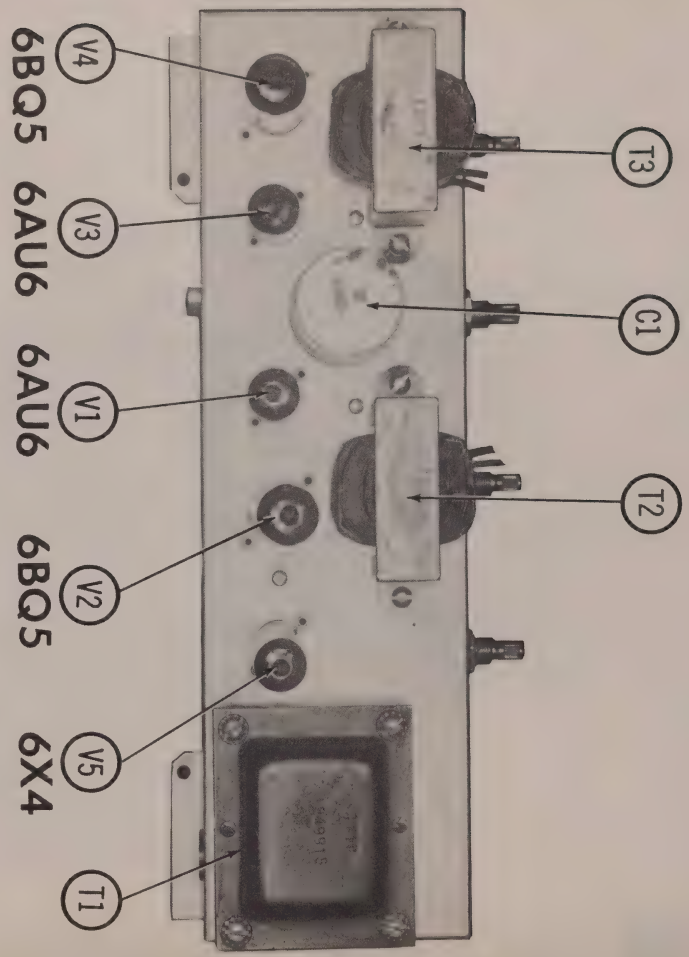
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	270K	
R6	10meg	
R7	270K	
R8	27K	
R9	1500Ω	
R10	68K	

ITEM No.	RATING	REMARKS
R11	220Ω 1W	
R12	270K	
R13	10meg	
R14	270K	
R15	1500Ω	
R16	68K	

ITEM No.	RATING	REMARKS
R17	220Ω 1W	
R18	4700Ω 1W	
R19	100K	
R20	130Ω 2W	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .51A	520 VCT @.060A	6.3 VCT @2.8A	1110						R-8B①

① Tape 5V Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6000Ω	3-4Ω	1217	22S62	A-2935	AU-606	A-3824	22S62	S-5X	
T3	6000Ω	3-4Ω	1217	22S62	A-2935	AU-606	A-3824	22S62	S-5X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω	2648 *	46A1	* Used in Models GAA-1019A, B
SP2	4"	PM	6-8Ω	2647 *	4A1Z7	† 2 Used in Models GAA-2691A, -2692A, -2693A
SP3	6"	PM	3-4Ω	2646 *	6A2i	
SP4	4"	PM	6-8Ω	2647 *†	4A1Z7	
	8"	PM	3-4Ω	2633B †		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	AIRLINE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	60-66	13TB	Not Req.	66	Not Req	46	Not Req	10T2-S	Not Req.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	AIRLINE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2		* W-203STDS ♦	* 46 †	† Jewel ♦ Diamond * Includes Cartridge

CABINETS & CABINET PARTS

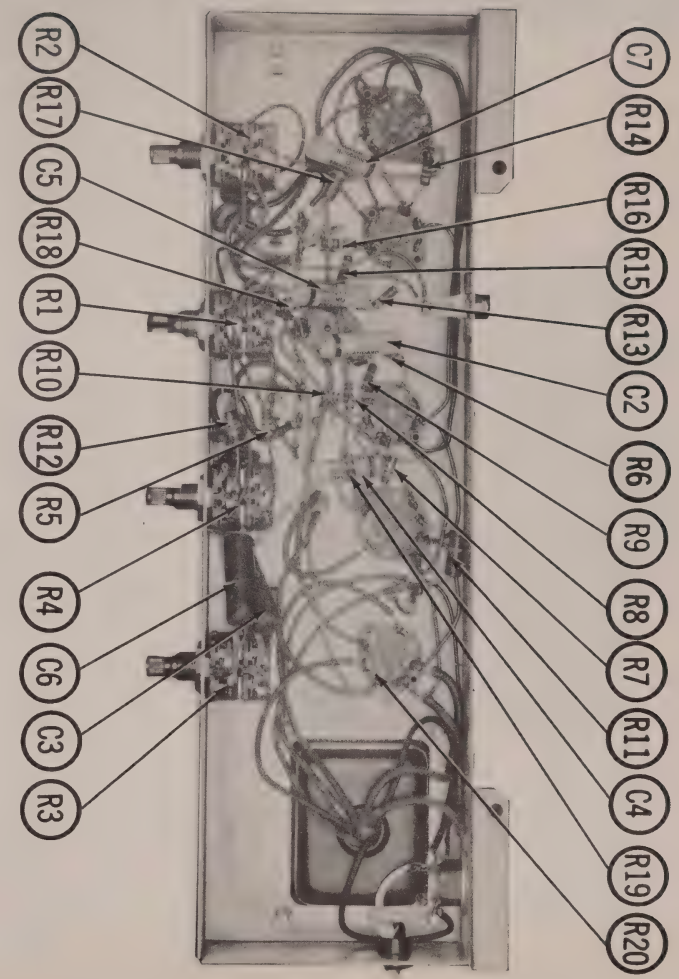
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	2462	Treble, Bass, Loudness, Balance

WIRING DATA

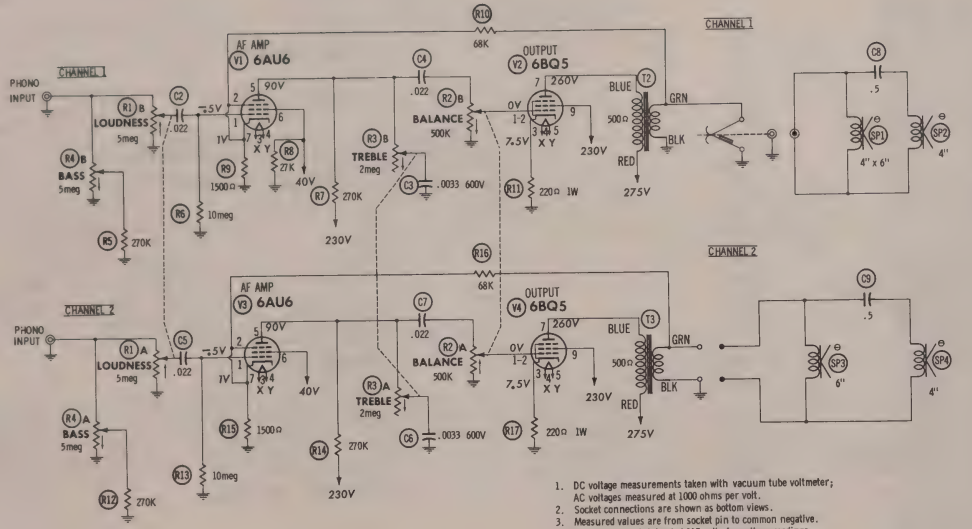
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

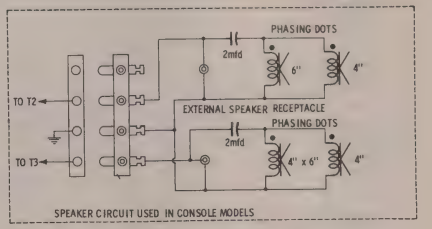
CHASSIS—BOTTOM VIEW

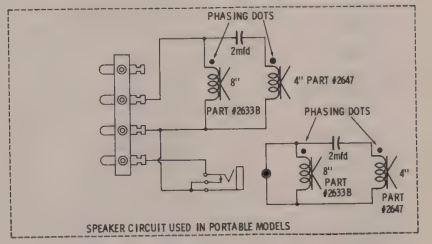


AIRLINE MODELS GAA-1019A, B, GAA-2691A, GAA-2692A, GAA-2693A

FOLDER 4





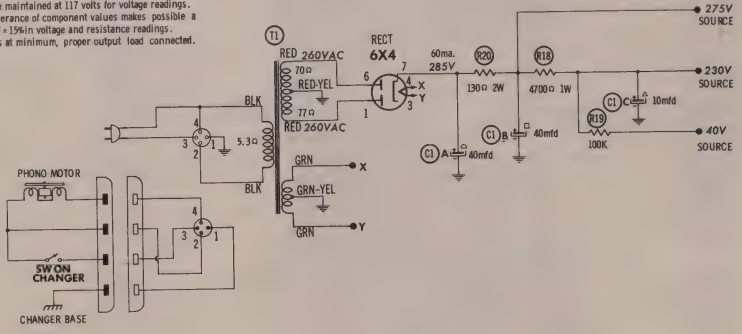


1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AU6	10meg	1500Ω	.2Ω	.2Ω	†275K	†100K	1500Ω		
V2	6BQ5	0Ω	0Ω	220Ω	.2Ω	.2Ω	NC	†630Ω	NC	†4800Ω
V3	6AU6	10meg	1500Ω	.2Ω	.2Ω	†275K	†100K	1500Ω		
V4	6BQ5	0Ω	0Ω	220Ω	.2Ω	.2Ω	NC	†630Ω	NC	†4800Ω
V5	6X4	77Ω	NC	.2Ω	.2Ω	TP	70Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AIRLINE MODELS GAA-1019A, B, GAA-2691A, GAA-2692A, GAA-2693A

PHOTOFACT® Folder

AIRLINE MODELS GAA-2640A, GAA-2641A, GAA-2689B

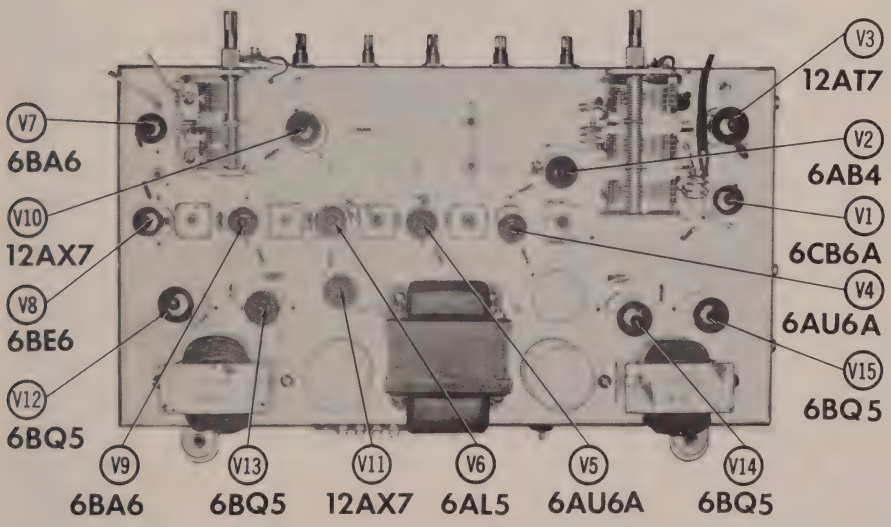
AIRLINE MODELS GAA-2640A, GAA-2641A, GAA-2689B

MODEL GAA-2640A

AIRLINE MODELS GAA-2640A, GAA-2641A, GAA-2689B

TRADE NAME	Airline Models GAA-2640A, GAA-2641A, GAA-2689B		
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago 7, Illinois		
TYPE SET	AC Operated 15 Tube FM-AM Receiver with 4 Speed Automatic Stereo Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	103 Watts, 1 Amp. @ 117 Volts AC (FM)
TUNING RANGE	BROADCAST 540-1620KC	FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE V-M 1201 - PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JN846

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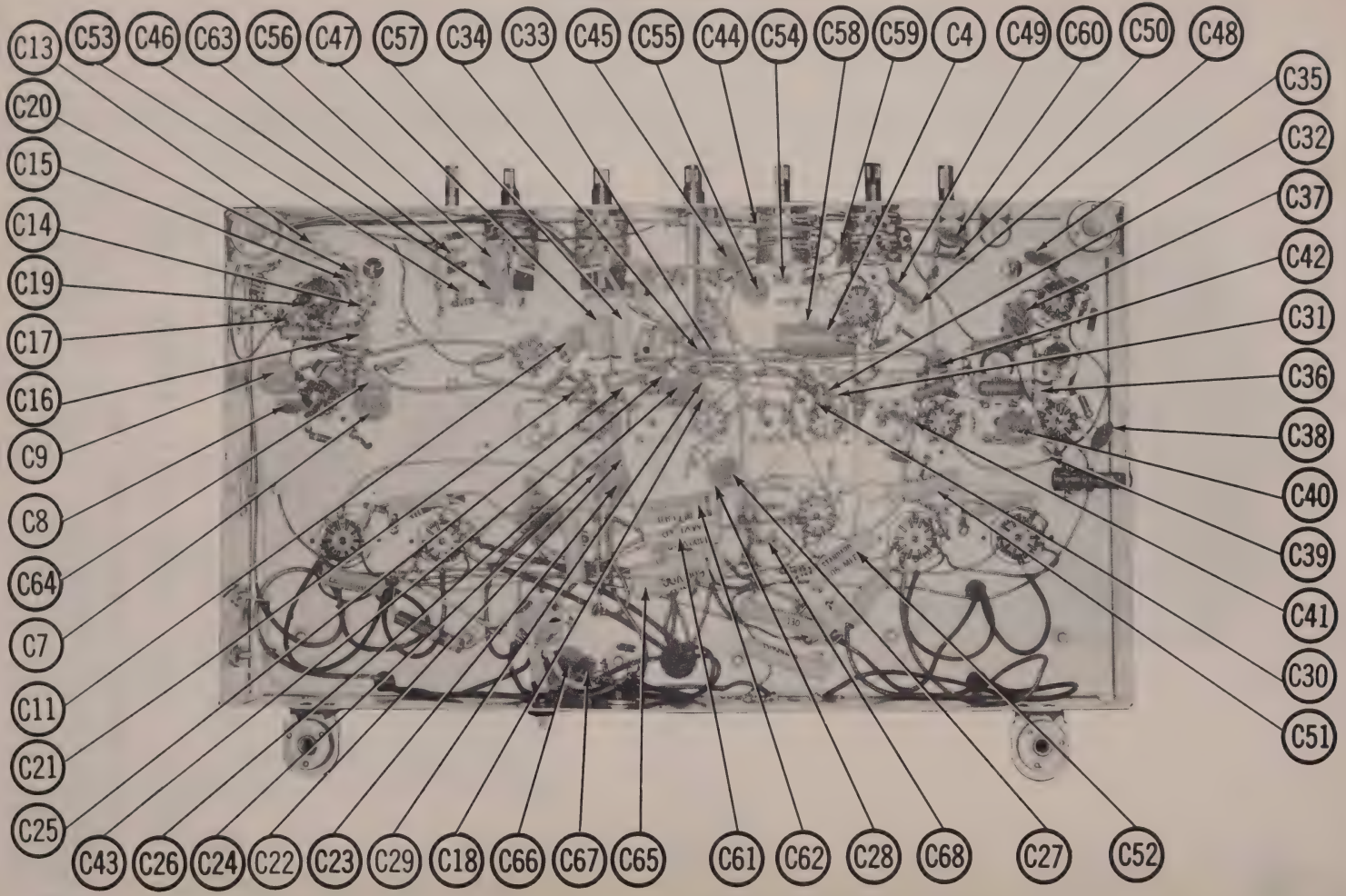
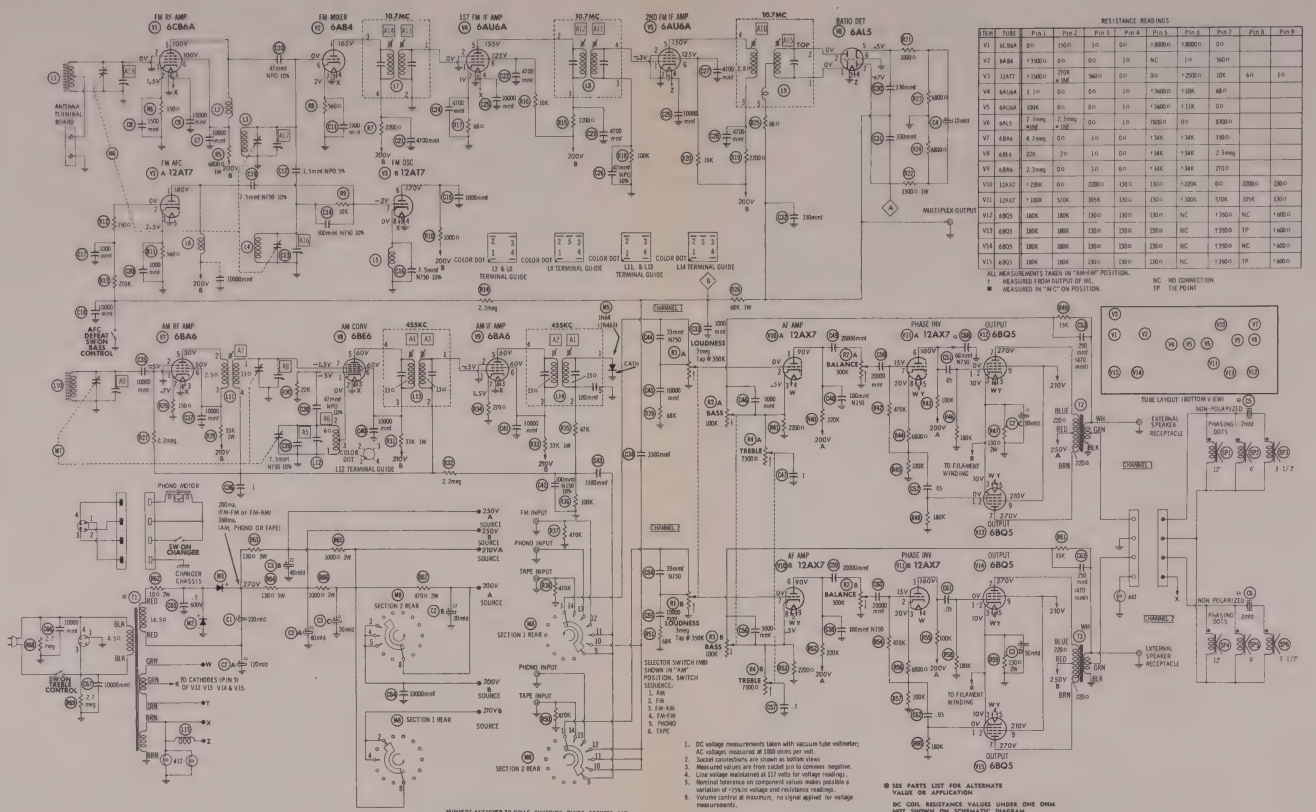
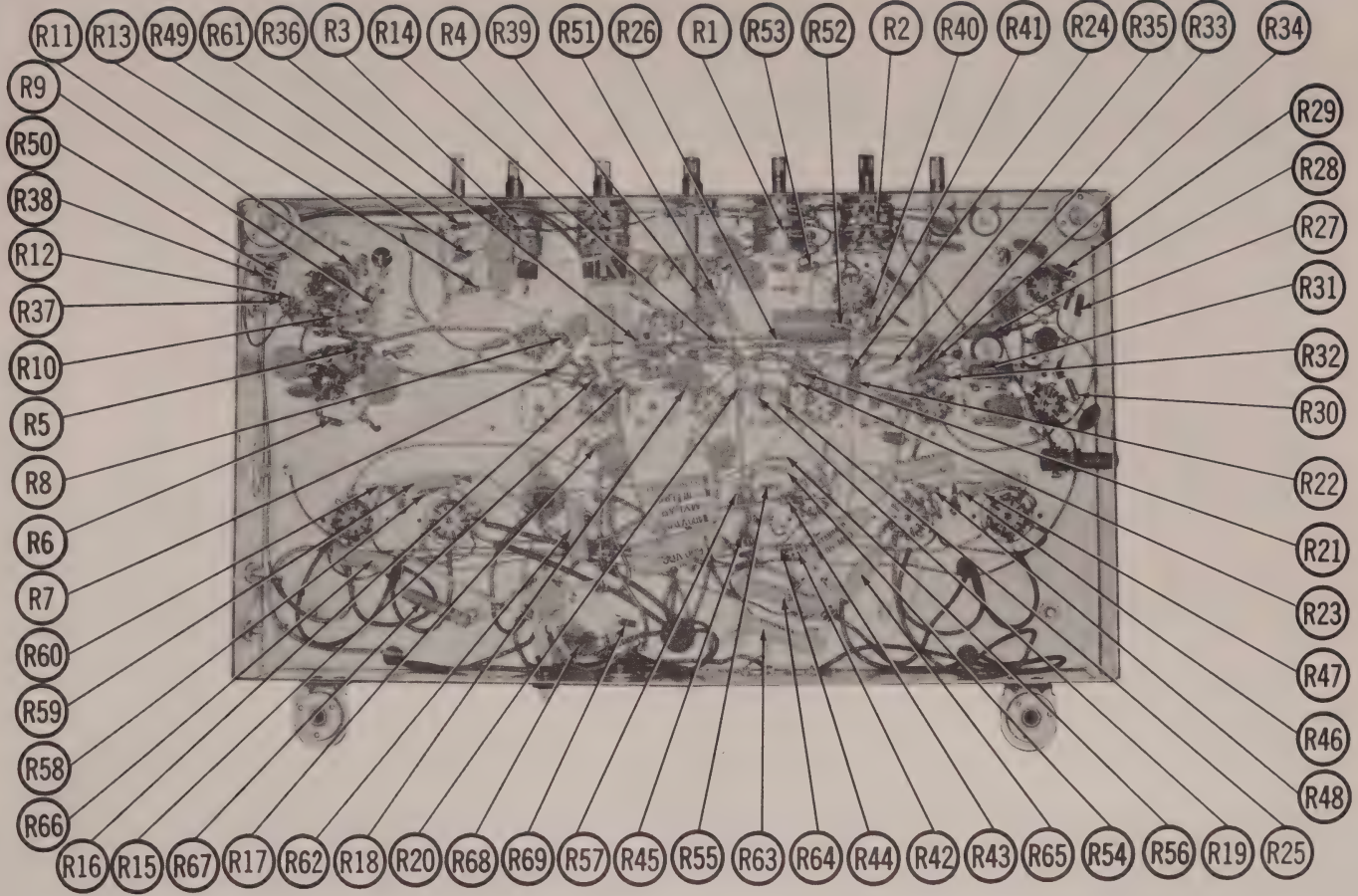
SET 496 FOLDER 5



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


FM RF AMP V1 6CB6A
FM MIXER V2 6AB4
1ST FM IF AMP V4 6AU6A
2ND FM IF AMP V5 6AU6A
RATIO DET V6 6AL5
10.7MC
FM AFC V7 A 12AT7
FM OSC V7 B 12AT7
ANTENNA TERMINAL BOARD
MULTIPLEX OUTPUT
AM RF AMP V8 6BA6
AM CONV V9 6BE6
455KC
AM IF AMP V10 6BA6
AFC DEFEAT SWCH. BASS CONTROL
AF AMP V10A 12AX7
PHASE INV V11A 12AX7
OUTPUT V12 6BQ5
OUTPUT V13 6BQ5
AF AMP V10B 12AX7
PHASE INV V11B 12AX7
OUTPUT V14 6BQ5
OUTPUT V15 6BQ5
TUBE LAYOUT (BOTTOM VIEW)
EXTERNAL SPEAKER RECEPTACLE
PHASING DOTS
PHASING SWCH.
TO FILAMENT WINDING
PHONO MOTOR
SW ON CHANGER
CHANGER CHASSIS
SW ON TREBLE CONTROL
TO CATHODES (PIN 7) OF V12 V13 V14 & V15.
SELECTOR SWITCH (MB) SHOWN IN "AM" POSITION. SWITCH SEQUENCE: 1. AM 2. FM 3. FM-AM. 4. FM-M 5. PHONO 6. TAPE
SECTION 2 REAR
SECTION 1 REAR
SECTION 1 REAR
SECTION 2 REAR
CHANNEL 1
CHANNEL 2
CHANNEL 1
CHANNEL 2
L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L18 L19 L20 L21 L22 L23 L24 L25 L26 L27 L28 L29 L30 L31 L32 L33 L34 L35 L36 L37 L38 L39 L40



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

AIRLINE MODEL GAA-2640A

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4, A7	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989 WALSCO #2515, 2531, 2532
A5, A8, A9, A17, A18 ..	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A6, A10 thru A15	GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440 WALSCO #2526, 2543, 2544, 2545
A16	GENERAL CEMENT #8721, 8722 WALSCO #2519

AM ALIGNMENT - SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	(AM) Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	600KC	Tune to 600KC signal	"	A6, A7	"
4.	"	1400KC	Tune to 1400KC signal	"	A8, A9	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM - SELECTOR IN FM POSITION

AFC "OFF"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru 5000mmf to pin 6 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference	DC probe to point (A). Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
6.	"	"	"	DC probe to point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE - SELECTOR IN FM POSITION

AFC "OFF"

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru 5000mmf to pin 6 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A10, A11, A12, A13, A14	Disconnect Stabilizing Capacitor C4. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C4.
6.	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT - SELECTOR IN FM POSITION

AFC "OFF"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 120Ω in each lead.	108.5MC (Unmod.)	(FM) Tuning gang fully open	DC probe to point (A). Common to chassis.	A16	Adjust for maximum deflection.
8.	"	105MC	Tune to 105MC signal	"	A17, A18	Adjust for maximum deflection. while rocking tuning gang.

FIG. 1

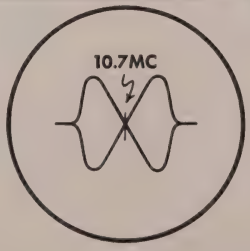
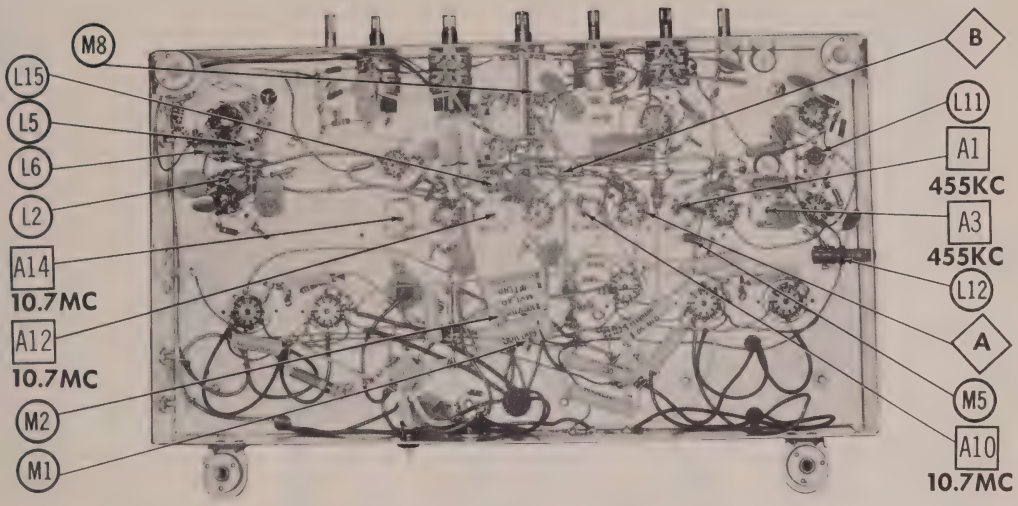
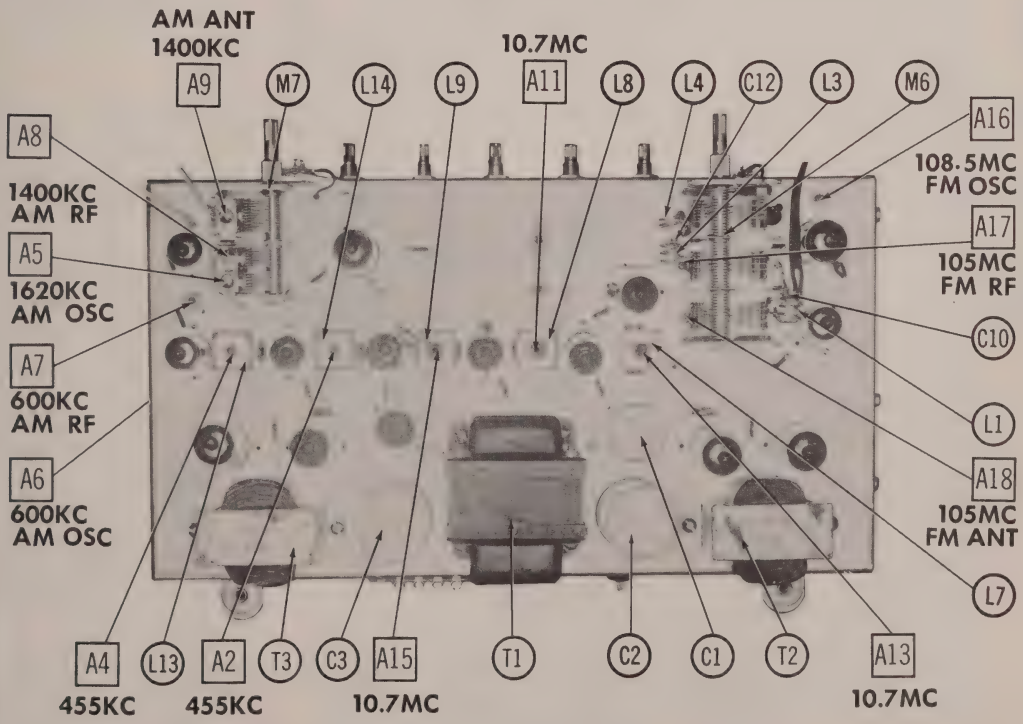


FIG. 2



CHASSIS BOTTOM VIEW - ALIGNMENT, INDUCTOR & MISC. IDENT.



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6CB6A
V2	FM Mixer	6AB4
V3	FM Osc. - FM AFC	12AT7
V4	FM IF Amplifier	6AU6A
V5	FM IF Amplifier	6AU6A
V6	Ratio Detector	6AL5
V7	AM RF Amplifier	6BA6
V8	AM Converter	6BE6
V9	AM IF Amplifier	6BA6

ITEM No.	USE	TYPE
V10	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7
V11	Channel 1 Phase Inv. - Channel 2 Phase Inv.	12AX7
V12	Channel 1 Output	6BQ5
V13	Channel 1 Output	6BQ5
V14	Channel 2 Output	6BQ5
V15	Channel 2 Output	6BQ5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	150	922	PRS1510	BRI0015	TC493	TD-100-150	TVA-1420	
C2A	120	150	1033		C0230			TVLS-3638.12*	
B	20	350			BBR50-25				
C	50	25							
C3A	40	350	1032	AFH4-79-10	D0460	FP430.6	TMQ58	TVL-4622.3	
B	40	350							
C	30	350							
D	50	25							
C4	10	25	916	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	
C5	2	10NP	847 ①	NP-PRS7300	WMF1W2E	TCN502		TVANS-1202 *	
C6	2	10NP	847 ①	NP-PRS7300	WMF1W2E	TCN502		TVANS-1202 *	

① Some versions may use Part #830A (50V), or .5mfd 100V Part #849 in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C8	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C9	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C10	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCU-Q47
C11	1500		BPD-0015	DD-152	BYA10D15	CCD-152	CCD-152	5HK-D15
C12	1.5 NPO 5%		NPO-SI 1.5	TCZ-1R5	C10V15C		CNO-515	10TCC-V15
C13		#833						

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C14	100 N750 10%		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C15	1000		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C16	7.5 N750 10%	#913			C10V8C			
C17	1000		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C18	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C19	7.5 N750 10%	#913			C10V8C			
C20	1000		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C21	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C22	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C23	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C24	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C25	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C26	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C27	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C28	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C29	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C30	330		BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C31	330		BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C32	330		BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C33	1000		BPD-001	DD-102	BYA10DI	CCD-102	B-210	5HK-D10
C34	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C35	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C36	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C37	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C38	47 NPO 10%		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C39	7.5 N750 10%	#913			C10V8C			
C40	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C41	10000		BPD-01	DD-103	BYA10SI	CCD-103 *	B-110	5HK-S10 10TCP-T10
C42	100 N150 10%	#835						
C43	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C44	33 N750		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C45	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C46	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C47	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104 *	GEM-201	2TM-P1 10TCP-T10
C48	100 N150	#835						
C49	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C50	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C51	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C52	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C53	250	(470) †	DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C54	33 N750		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C55	10000		BPD-01	DD-103	BYA10SI	CCD-103	B-110	5HK-S10
C56	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C57	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104 *	GEM-201	2TM-P1 10TCP-T10
C58	100 N150	#835						
C59	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C60	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C61	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C62	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C63	250	(470) †	DI-250	DD-251	L10T25	CCD-251	GP325	10TS-T25
C64	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C65	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C66	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C67	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	68 N750	Note 1	N750-DI 68	DTN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68

† Alternate Value. # Airline Part Number. Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	3meg	1/2	442	BT-180 *				Loudness, Channel 1
	350K Tap							
B	3meg	1/2		STR-180 *				Loudness, Channel 2
	350K Tap							
R2A	500K	1/2	436	B-60				Balance, Channel 2
B	500K	1/2		SR-613				Balance, Channel 1
R3A	100K	1/2	432					Bass, Channel 2
B	100K	1/2						Bass, Channel 1
C	Shaft							Push-Pull AFC
R4A	7500Ω	1/2	443					Treble, Channel 2
B	7500Ω	1/2						Treble, Channel 1
C	Shaft							Push-Pull, Off-On

* Do not use tap #2.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	6800Ω 1W	
R6	150Ω	
R7	2200Ω	
R8	560Ω	
R9	10K	
R10	1000Ω	
R11	560Ω	
R12	150Ω	
R13	270K	
R14	2.2meg	
R15	2200Ω	
R16	10K	
R17	68Ω	
R18	100K	
R19	2200Ω	
R20	10K	
R21	1000Ω	
R22	1500Ω 1W	
R23	6800Ω	
R24	4500Ω	
R25	68Ω	
R26	68K 1W	
R27	2.2meg	
R28	33K 1W	
R29	150Ω	
R30	22K	
R31	33K 1W	
R32	2.2meg	
R33	33K 1W	
R34	270Ω	
R35	47K	
R36	100K	
R37	470K	
R38	470K	
R39	68K	
R40	220K	
R41	2200Ω	
R42	470K	

RESISTORS (cont)

ITEM No.	RATING	REMARKS
R43	100K	
R44	6800Ω	
R45	100K	
R46	180K	
R47	130Ω 2W	
R48	180K	
R49	15K	
R50	470K	
R51	68K	
R52	220K	
R53	2200Ω	
R54	470K	
R55	100K	
R56	6800Ω	
R57	100K	
R58	180K	
R59	130Ω 2W	
R60	180K	
R61	15K	
R62	10Ω 2W	
R63	130Ω 5W	
R64	130Ω 5W	
R65	1000Ω 2W	
R66	1000Ω 2W	
R67	470Ω 2W	
R68	2.7meg	
R69	2.7meg	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AIRLINE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil							
L2	RF Choke	1303	19-1000	19-1000	BC-561	4602		luh ①
L3	FM RF Coil							
L4	FM Osc. Coil							
L5	Cathode Choke	1303	19-1000	19-1000	BC-561	4602		luh ①
L6	RF Choke	1303	19-1000	19-1000	BC-561	4602		luh ①
L7	1st FM IF Trans.	1409	18-3487	18-3487	FM-254	1463		
L8	2nd FM IF Trans.	1413A	18-3487	18-3487	FM-254	1463		
L9	Ratio Det.	1414A	17-3498	17-3498	FM-255	1465		
L10	Loopstick	1512E	14-7002	14-7002	BC-418	705-A		
L11	AM RF Trans.	1412	14-1072	14-1072	BC-388	70-RF		
L12	AM Osc. Coil	1401C			BC-393	70-OSC		
L13	1st AM IF Trans.	1405	18-6758	17-6758	BC-352	12-C1	RF-1	
L14	2nd AM IF Trans.	1406A	18-6758 †	18-6758 †	BC-353 †	12-C2 †	RF-2 †	
L15	Fil. Choke	1303	19-1000	19-1000	BC-561	4602		luh ①

① IRC Part #CLA. † Connect 100mmf cap externally.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1A	120V @ .620A	6.3VCT @ 3.7A	1109A ①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 2.9A									

① Alternate Part #1109.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8500Ω CT	6-8Ω CT	1215	22S88	A-3027	AU-609	A-3870	22S88	S-57Z	
T3	8500Ω CT	6-8Ω CT	1215	22S88	A-3027	AU-609	A-3870	22S88	S-57Z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	2643	12A4A	* May replace SP3 and SP6 in some versions of GAA-2689B
SP2	6"	PM	14-16Ω	2644	6A21Z15.8	♦ Alternate
SP3	3½"	PM	6-8Ω	2645	3A15TZ7.8	
SP4	12"	PM	3-4Ω	2643	12A4A	
SP5	6"	PM	14-16Ω	2644	6A21Z15.8	
SP6	3½"	PM	6-8Ω	2645	3A15TZ7.8	
	3½"	PM	14-16Ω	2633 *	3A15T	
	8"	PM		2650 ♦	3A15T	
	4"	PM		2647 ♦		
	8"	PM		2649 ♦		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	AIRLINE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.200A		5E4 *	RE504 *	40K	SR500 *	* Silicon Type
M2	.200A		5E4 *	RE504 *	40K	SR500 *	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	AIRLINE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M3	60-66	13TB	Not Req.	26S	S1-1 & S3-3	53	E98X, E98XD	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	AIRLINE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M4	(78RPM)	W-101STS † or W-101STD ♦	E98 † or E98D ♦	† Jewel ♦ Diamond
	(LP)	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		AIRLINE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M5	1N64 *		1N60	1N60	1N60	AM Detector (Pigtail)

* Alternate Type 1N461.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M6	Tuning Cap.	1021	FM 3 Gang
M7	Tuning Cap.	1025	AM 3 Gang: (Ant. 35-410mmf, RF 13-225mmf, Osc. 14-125mmf)
M8	Switch	433	Function

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	2439	FM, AM Tuning
Knob	2475	Loudness, Balance, Function
Knob	2476	Treble, Off-On
Knob	2477	Bass, AFC

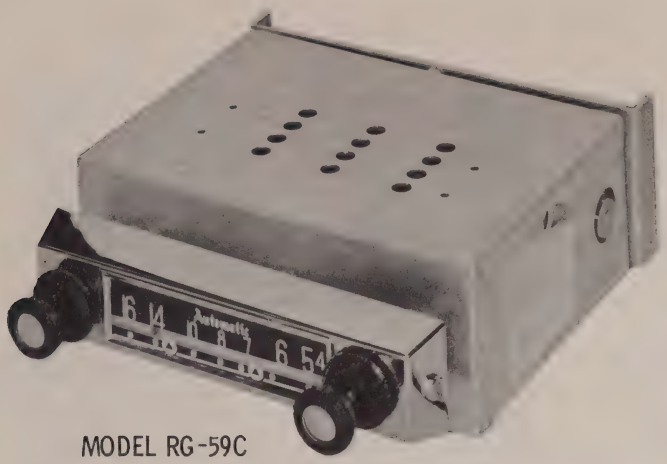
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

**AUTOMATIC MODELS
RG-59, RG-59C**

AUTOMATIC MODELS
RG-59, RG-59C



MODEL RG-59C

TRADE NAME	Automatic Models RG-59, RG-59C
MANUFACTURER	Automoatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston 15, Mass.
TYPE SET	Battery Operated 4 Tube, 2 Transistor Universal Type Automobile Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	538 — 1610KC RATING 1 Amp. @12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

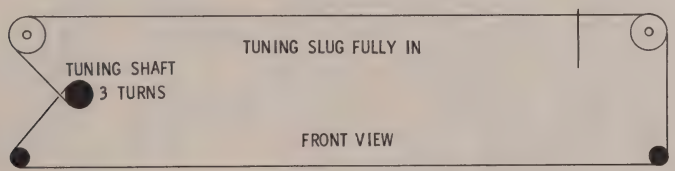
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

A5, A6..... GENERAL CEMENT #5000, 5003, 5066, 8271, 8272, 8276, 8277, 8290, 8609, 8722, 9150, 9298
WALSCO #2515, 2516, 2518, 2519, 2525, 2541

A7.....GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1610KC	"	"	A5	"
3.	High side thru 68mmf to antenna receptacle. Low side to chassis.	"	"	"	A6, A7	"
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JD839

DATE 8—60 SET 496 FOLDER 6

SET 496 FOLDER 6

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12EZ6 (12BL6) * (12AF6)	V3	IF Amplifier	12AF6 (12BL6) *
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12FT6 (12FM6) * (12AE6)

* Alternate

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N363	Driver	2N236B	2N406	2N363	2N406	PNP
X2	1124C	Output					PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	AUTOMATIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	100	15	20A963	PRS3200		TCD16 }		TVAS-3392 *	
B	500	15				TT15X100 }			
C	100	15							
C2	750	3	20-757	SRE3V500	BR1000-6	PETA190	TD-1000-6	TVAS-1097 *	①

① Some versions may use 150mfd@10V in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3		#28-800L						
C4	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C5	40		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C6	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C7		#28-101						
C8	5 NPO	(12) †	NPO-DI 5.0	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C9	40 NPO		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C10		#28-161						
C11	300 10%		1469-0003	TCZ-300	22R5T3	CM-19B-301K	MCB241	MS-33
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	27		DI-27	DD-270	L10Q27	CCD-270	GP327	10TS-Q27
C14	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C15	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C20	.25 100V		P288N-25		CUB2P25	1DP-3-254	GEM-2025	2TM-P25

\# Automatic Part Number.
† Alternate Value
Note 1. Not used in some versions.

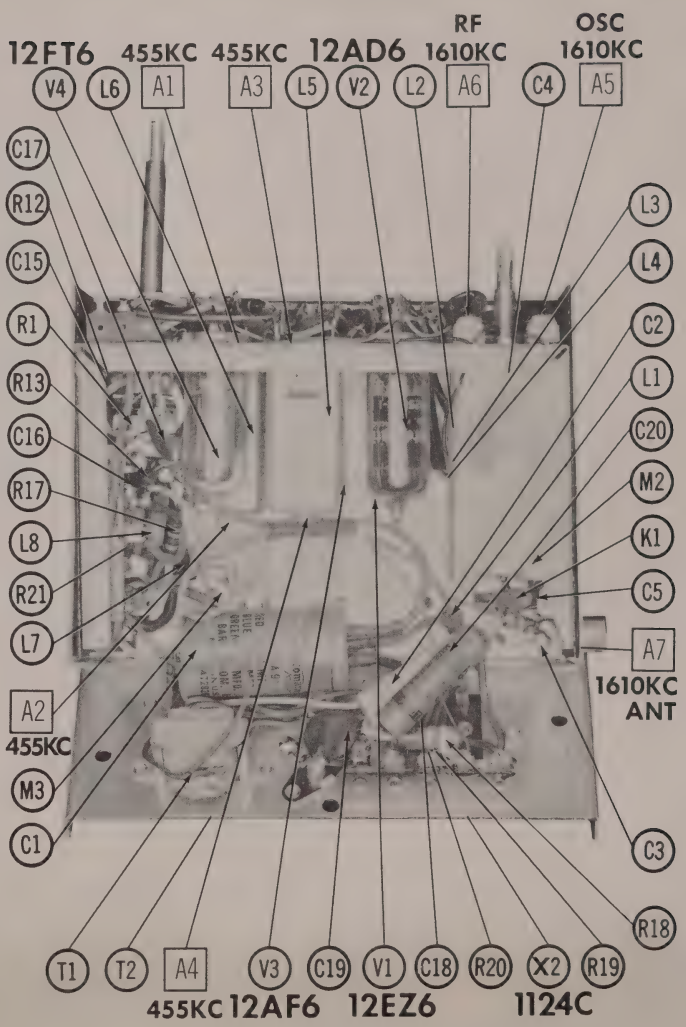
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AUTOMATIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	≷	80A960	F1-68	RTV-703C			
B	1meg 160K Tap			R2-57		† QJ-992A	■ UE3994-S	Tone Volume
C	Bushing			AK-26	XB-2			
D	Switch			KR-4				Power-Off-On

† "Concentrikit" equivalent: K-8 Kit with base elements and shafts: B13-139, P14-208 (Panel)
B13-137X, R1-218 (Rear)
S46 (Bushing)
76-1 (Switch)

■ "STA-LOC" equivalent: FG26A, RU16T164, OS2312, 1S2750, U841.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1meg	
R3	10meg	
R4	10meg	
R5	4.7meg	
R6	150Ω	
R7	150K	
R8	330Ω	

ITEM No.	RATING	REMARKS
R9	2.2meg	
R10	47K	
R11	330Ω	
R12	100K	
R13	820Ω	
R14	2.2meg	
R15	6800Ω	

ITEM No.	RATING	REMARKS
R16	220Ω	
R17	6800Ω	Note 1
R18	390Ω	Note 2
R19	22Ω	
R20	1Ω 1W	
R21	150Ω	

Note 1. Not used in some versions.
Note 2. Some versions may use a 500Ω control in this application (Part #62-502).

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AUTOMATIC PART No.	REPLACEMENT DATA
K1	Antenna Filter	100mmf, 1.2meg	89-4204	Sprague PRC-9

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		AUTOMATIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	RF Choke	14-59						Wound on Res.
L2	Ant. Coil	†						
L3	RF Coil	†						Part of M2 †
L4	Osc. Coil	†						
L5	Input IF Trans.	14-1655-6	16-6758	16-6758	BC-352	12-C1	RF-1	
L6	Output IF Trans.	14-1655-6	16-6758	16-6758	BC-353	12-C2	RF-2	
L7	"A" Lead Choke	14-205						10uh

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L8	1A	.6Ω	.009 HY	75A6001						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.2	1	75-1109①						

① Alternate Part #75A1108

TRANSFORMER (AUDIO OUTPUT)

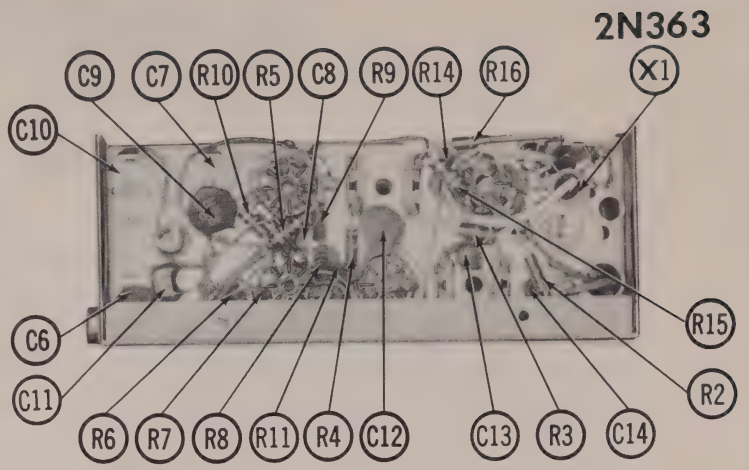
ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	AUTOMATIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	15Ω	3-4Ω	75A1106A①							

① Alternate Part #75A1106.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AUTOMATIC PART No.	QUAM PART No.	
SP1	2½"x10"	PM	3-4Ω	73B969		

CHASSIS—END VIEW



FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AUTOMATIC PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V			30707.5 (SFE 7½A 32V)	155009	SFE 7½	HHH

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M2	Tuner	78A950	Complete
M3	Spark Plate	43-215	

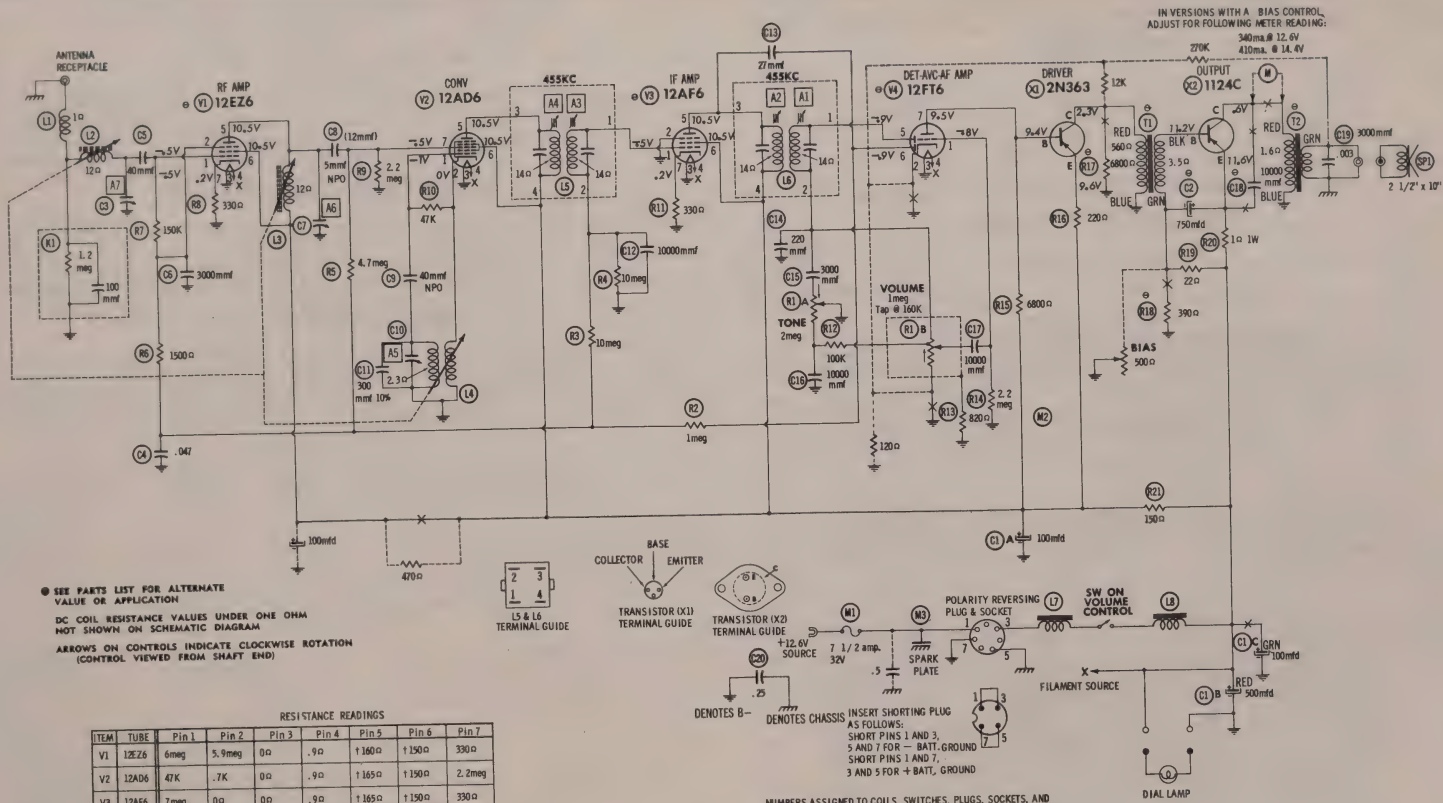
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47B319-1	Tuning
Knob	47B319-2	Tuning
Knob	47B394	Tone
Knob	47B394-1	Dummy
Pointer	84A454	
Dial Scale	39-16	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12EZ6	6meg	5.9meg	0Ω	.9Ω	†160Ω	†150Ω	330Ω
V2	12AD6	47K	.7K	0Ω	.9Ω	†165Ω	†150Ω	2.2meg
V3	12AF6	7meg	0Ω	0Ω	.9Ω	†165Ω	†150Ω	330Ω
V4	12FT6	2.2meg	0Ω	0Ω	.9Ω	1meg	6.5meg	

† MEASURED FROM JUNCTION OF R20 AND R21.
TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes posssible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AUTOMATIC MODELS RG-59, RG-59C

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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**COLUMBIA MODELS
953, 955, 957**

COLUMBIA MODELS
953, 955, 957

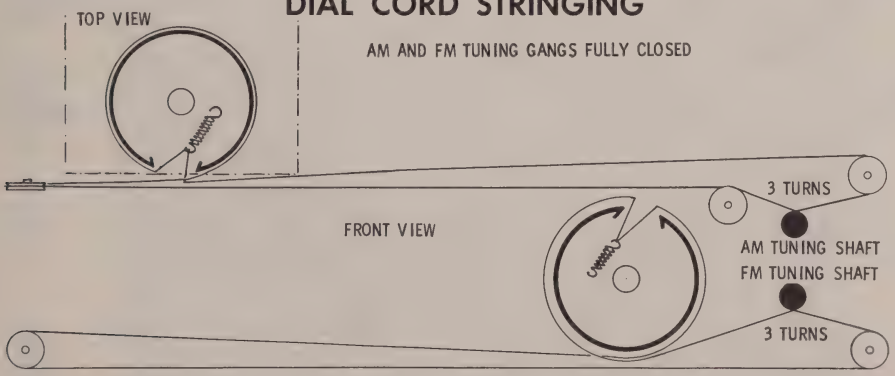
MODEL 955

COLUMBIA MODELS
953, 955, 957

TRADE NAME	Columbia Models 953, 955, 957
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated 8 Tube FM-AM Tuner, 1 Tube Stereo Preamplifier, 4 Tube Stereo Amplifier, and 4 Speed Automatic Record Changer (Model 953 Does Not Have FM-AM Tuner)
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 92 Watts, .86 Amp. @ 117 Volts AC (Radio)
TUNING RANGE—BROADCAST	535 - 1650KC FREQ. MOD. 88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE GLASER-STEERS GS-77 — PHOTOFACT SET 399 FOLDER 7 OR RECORD CHANGER MANUAL RC-11

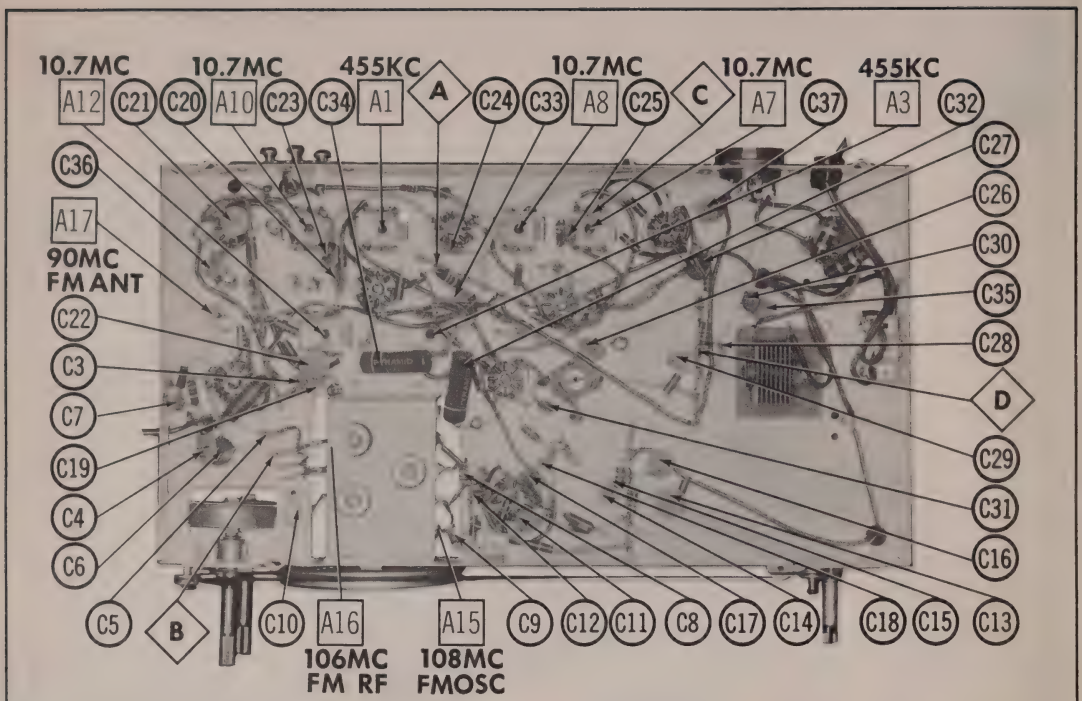
DIAL CORD STRINGING



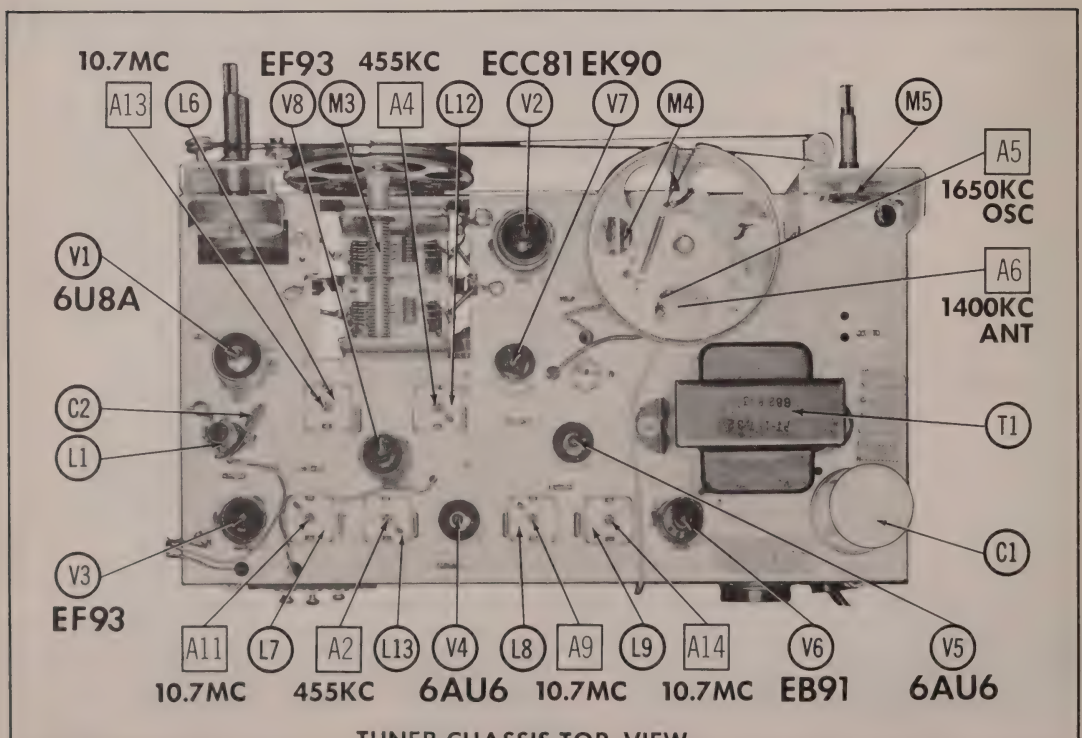
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JN875

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



TUNER CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TUNER CHASSIS-TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
To Adjust pointer, close tuning gangs and set pointer to "O" on logging scale.
Suggested alignment tools: A1 thru A4, A7 thru A14. . GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6, A16.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A15.....GENERAL CEMENT #8721, 8722
WALSCO #2519
A17.....GENERAL CEMENT #5003, 8271, 8275, 8276, 8609, 8721, 8722, 9150, 9298
WALSCO #2516, 2518, 2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum deflection.
3.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum deflection while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

AFC "Off"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to point (B). Low side to chassis.	10.7MC (Unmod.)	(FM) Tuning gang fully open.	DC probe thru 1meg to point (C). Common to chassis.	A7, A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	DC probe to point (D). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

AFC "Off"
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to point (B). Low side to chassis.	10.7MC (450KC Swp)	(FM) Tuning gang fully open.	Vert. amp. thru 27K to point (C). Low side to chassis.	A7, A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1.
5.	"	"	"	Vert. amp. to point (D). Low side to chassis.	A14	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

AFC "Off"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod.)	(FM) 108MC	DC probe thru 1meg to point (C). Common to chassis.	A15	Adjust for maximum deflection.
7.	"	106MC	Tune to 106MC signal.	"	A16	Adjust for maximum deflection while rocking tuning gang.
8.	"	90MC	Tune to 90MC signal.	"	A17	Adjust for maximum deflection.

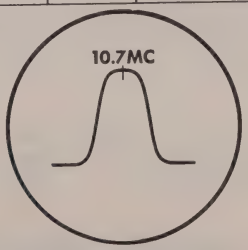


FIG. 1

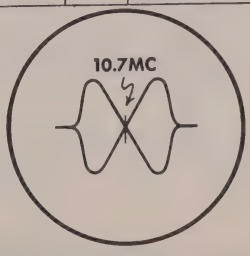
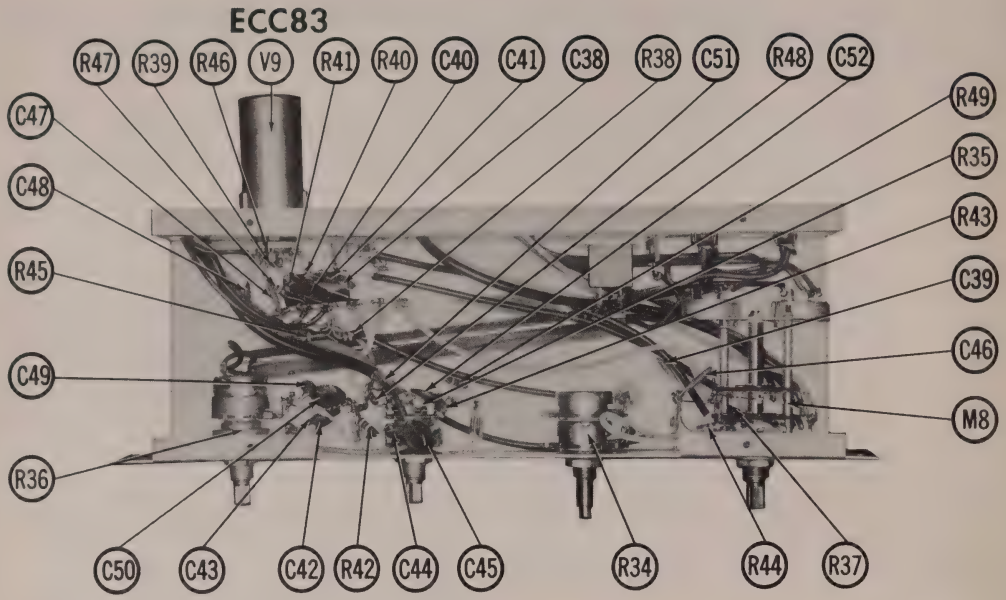
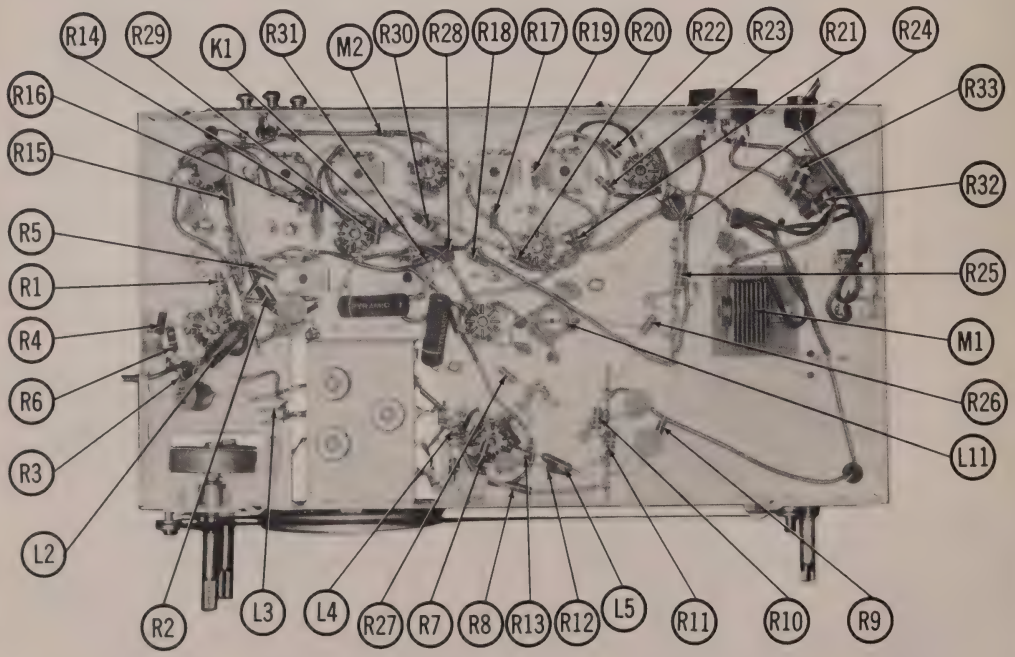


FIG. 2



PREAMP CHASSIS - BOTTOM VIEW



TUNER CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR & MISC. IDENT.

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Mixer	6U8A	V5	FM Limiter	6AU6
V2	FM Osc. -FM AFC	ECC81/12AT7	V6	Discriminator	EB91/6AL5
V3	1st FM IF Amp.	EF93/6BA6	V7	AM Converter	EK90/6BE6
V4	2nd FM IF Amp.	6AU6	V8	AM IF Amp.	EF93/6BA6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	200	11F746	AFH4-02	D0016	FP318.74	TMT-181	TVLS-3482.1*	
B	■40	200							
C	▲20	200							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C3	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	220		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C6	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C7	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C8	2.2 10%		NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V22
C9	68 NPO		NPO-SI 68	TCZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68
C10		#20F337						
C11	100 N150					"		10TCP-T10
C12	910		DI-1000	DD-911	L10T91	CCD-102	GP210	10TS-D10
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C15	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C18	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	100 N150					"		10TCP-T10
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C28	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C29	330		BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C30	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C31	47 N750		N750-DI 47	DTN-47	C10Q47C	CCTN-470	CN7-447	10TCU-Q47
C32	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C33	1600 10%	Note 1	DI-1500	DD-162	1R5D16	CCD-152	GP216	10TS-D16
C34	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C35	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D5
C36	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

\# Columbia Part Number.
Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	270K	
R2	220Ω	
R3	68Ω	
R4	2.2meg	
R5	15K	
R6	560Ω	
R7	22K	
R8	10K	
R9	1000Ω	
R10	47K	
R11	470K	

ITEM No.	RATING	REMARKS
R12	100Ω	
R13	560Ω	
R14	2.2meg	
R15	1000Ω	
R16	220K	
R17	1000Ω	
R18	1000Ω	
R19	100K	
R20	10K	
R21	15K	
R22	100K	

ITEM No.	RATING	REMARKS
R23	100K	
R24	33K	
R25	33K	
R26	1meg	
R27	22K	
R28	2.2meg	
R29	150Ω	
R30	470K	
R31	1000Ω	
R32	390Ω 1W	
R33	390Ω 1W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	COLUMBIA PART No.	REPLACEMENT DATA	
K1	AM Diode Filter	100mmf, 100mmf, 47K		Aerovox	PA-97
				Centralab	PC-50
				Cornell-Dubilier	11TM1
				Sprague	D-1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA COLUMBIA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	20F334						
L2	RF Choke	21F209	19-1008	19-1008	SW-631	4529		4.7uh
L3	FM RF Coil	20F336						
L4	FM Osc. Coil	20F335						
L5	RF Choke	21F210	19-1002	19-1002	SW-630	4606		2.7uh
L6	1st FM IF Trans.	20F329	16-3487	16-3487	FM-254	1463		
L7	2nd FM IF Trans.	20F329	16-3487	16-3487	FM-254	1463		
L8	3rd FM IF Trans.	20F329	16-3487	16-3487	FM-254	1463		
L9	Discriminator	20F331	17-3494	17-3494	FM-253	1464		
L10	Loopstick	20F333			BC-418			
L11	AM Osc. Coil	20F332				70-OSC		
L12	1st AM IF Trans.	20F330	16-6758	16-6758	BC-352	12-C1	RF-1	
L13	2nd AM IF Trans.	20F330	16-6758	16-6758	BC-353	12-C2	RF-2	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	REPLACEMENT DATA COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ .31A	105V Ⓐ .045A Tap Ⓐ 6.3V Ⓐ 2.7A	PT-157-B2 ①						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA COLUMBIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.045A	*	T100 *	1235AH *	100A *	SR200 ♦	* Selenium ♦ Silicon

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA COLUMBIA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N295		1N295	1N295	1N295	AM Detector (Pigtail)

TUNER PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M3	Tuning Cap.	14F108	FM, 2 Gang
M4	Tuning Cap.	14F107	AM, 2 Gang (Ant. 9-266mmf, Osc. 9-112mmf)
M5	Switch		AFC Off-On, (Rotary Wafer Type)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

PREAMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V9	Channel A Preamp. - Channel B Preamp.	ECC83/12AX7			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C38	25	50	11B731	SRE50V25	BBR25-50	TC36	TD-25-50	TVA-1306	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C39	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C41	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C42	180		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C43	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C44	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C45	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C46	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C47	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C48	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C49	180		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C50	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39
C51	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C52	3900		BPD-004	DD-392	L10D39	CCD-392	GP239	10TS-D39

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R34A	3meg	½	9B615					Loudness, Channel B
	300K Tap	½						
B	3meg	½						Loudness, Channel A
	300K Tap	½						
R35A	2meg	½	9B587	B-76	AD47-2meg-Z		FA26A	Bass, Channel A
B	2meg	½		SR-76	Not Req.		RU26A	Bass, Channel B
C	Shaft			Not Req.	KSS-3		CS3500	
R36A	2meg	½	9B588	B-76	AD47-2meg-Z		FA26A	Treble, Channel A
B	2meg	½		SR-76	Not Req.		RU26A	Treble, Channel B
C	Shaft			Not Req.	KSS-3		CS3500	
D	Switch			KR-1	SWE-12		US41	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R37	180K	
R38	100K	
R39	6.8meg	(10meg) *
R40	270K	
R41	27K	

ITEM No.	RATING	REMARKS
R42	470K	
R43	47K	
R44	180K	
R45	100K	
R46	6.8meg	(10meg) *

ITEM No.	RATING	REMARKS
R47	270K	
R48	470K	
R49	47K	

* Alternate Value.

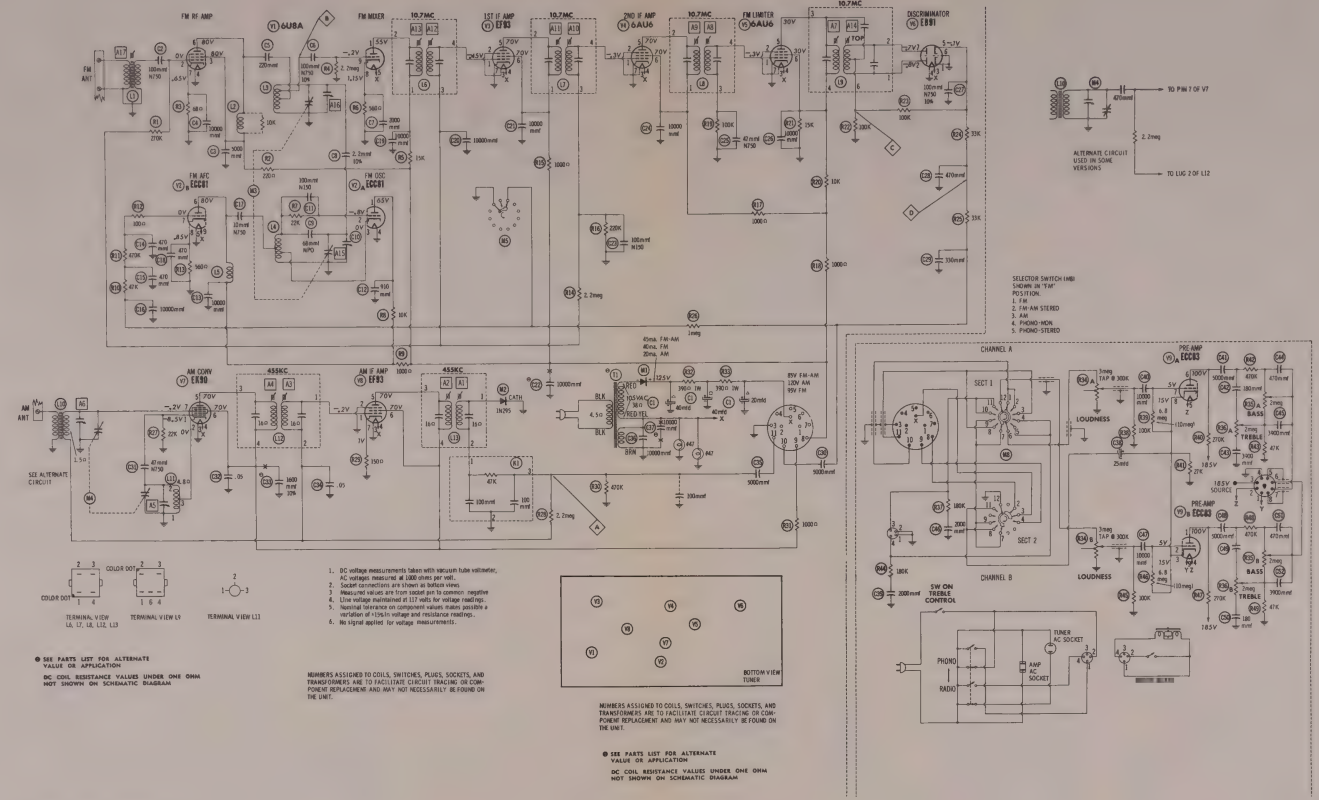
PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	COLUMBIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M6	SC-2D (Includes M7)	13TX		26D				8TA4-D	N-8TA-D

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS	
	COLUMBIA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.		
M7	(Part of M6)	W-110STS † or W-110STD ◆	CS-1XD	† Jewel	◆ Diamond



1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings.
6. No signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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COLUMBIA MODELS
953, 955, 957

TUNER & PREAMP SCHEMATIC

RESISTANCE READINGS

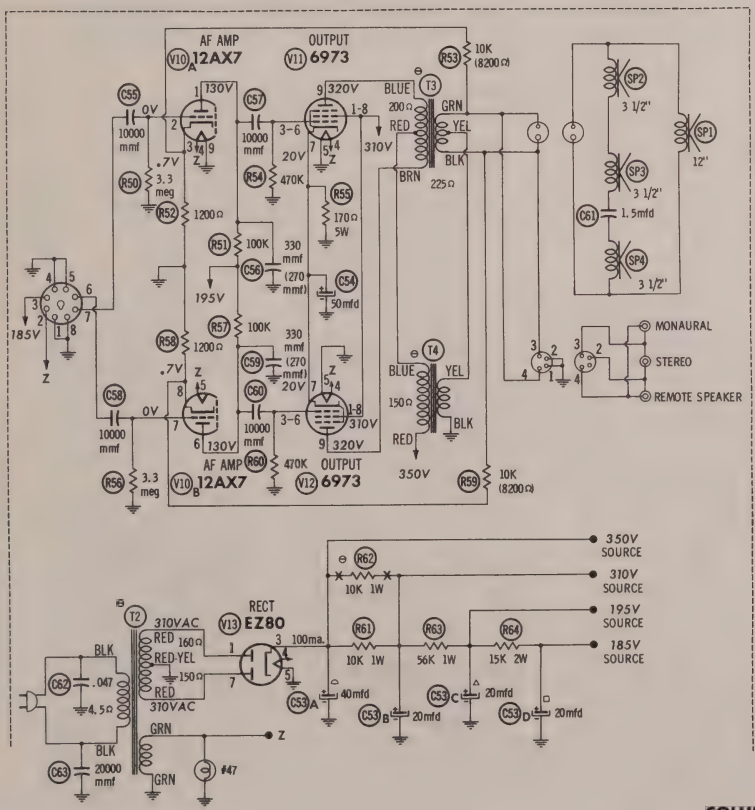
†ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BS8	†940Ω	400K	0Ω	.1Ω	0Ω	†4900Ω	0Ω	100Ω	0Ω
V2	6AB4	†125K	0Ω	.1Ω	0Ω	0Ω	.1Ω	1000Ω		
V3	12AZ7A	†940Ω	100K ▪ 2.6meg	270Ω	0Ω	0Ω	†11K	33K	0Ω	.1Ω
V4	6BA6	▬1.8meg	0Ω	.1Ω	0Ω	▬†3200Ω	▬†3200Ω	82Ω		
V5	6BE6	▬22K	330Ω	.1Ω	0Ω	▬†3200Ω	▬†3200Ω	▬ 1.8meg		
V6	6BA6	3.8Ω ▬ 1.5meg	0Ω	.1Ω	0Ω	†1000Ω	†1000Ω	150Ω		
V7	6CN7	800K	515K	6800Ω	0Ω	.1Ω	10K ▬ 15K	950K	†1400Ω	NC
V8	6AU6	100K	0Ω	.1Ω	0Ω	†1700Ω	†1700Ω	100Ω		
V9	6AU6	150K	0Ω	.1Ω	0Ω	†30K	†30K	0Ω		
V10	6EB8	0Ω	550K	470K	0Ω	.1Ω	0Ω	100K	†10K	†10K
V11	6AL5	0Ω	100K	.1Ω	0Ω	200K	0Ω	100K		
V12	EM80 6BR5	1.5meg	0Ω	†0Ω	0Ω	.1Ω	NC	†470K	†0Ω	†0Ω
V13	EZ80 6V4	45Ω	NC	¶	0Ω	.1Ω	NC	48Ω	NC	TP

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
▬ MEASURED IN "AM" POSITION.
▪ MEASURED IN "AFC" POSITION.
† MEASURED FROM PIN 3 OF V3.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM



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COLUMBIA MODELS 953, 955, 957

AMP SCHEMATIC

AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V10	Channel A AF Amp. - Channel B AF Amp.	12AX7	V12	Channel B Output	6973
V11	Channel A Output	6973	V13	Rectifier	EZ80

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C53A	▲40	450	11B725	AFH4-18-30	D0174	FP447	TMQ-123	TVL-4773	
B	20	450							
C	▲20	450							
D	■20	450							
C54	50	25		SRE25V50	BBR50-25	TC29	TD-50-25	TVA-1206	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C55	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C56	330	(270) †	BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C57	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C59	330	(270) †	BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C60	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C61	1, 5mfd 200V				WMF2W1P5B			118P15502S2
C62	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C63	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20

† Alternate Value.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R50	3.3meg	
R51	100K	
R52	1200Ω	
R53	10K	(8200Ω) *
R54	470K	

ITEM No.	RATING	REMARKS
R55	170Ω 5W	
R56	3.3meg	
R57	100K	
R58	1200Ω	
R59	10K	(8200Ω) *

ITEM No.	RATING	REMARKS
R60	470K	
R61	10K 1W	
R62	10K 1W	Note 1
R63	56K 1W	
R64	15K 2W	

* Alternate Value.
Note 1. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V ② .64A	620 VCT ② .100A	6.3V ② 2.9A	TR-131①				PC-8422②		R-39A②

① Alternate Part #2B107. ② Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	5000Ω CT	3-4Ω CT	TR144①							
T4	2300Ω	1-2Ω	TR145②							

① Alternate Part #3B225
② Alternate Part #3B226

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	1B136	12A6A	
SP2	3½"	PM	3-4Ω	1B125	3A07	
SP3	3½"	PM	3-4Ω	1B125	3A07	
SP4	3½"	PM	3-4Ω	1B125	3A07	

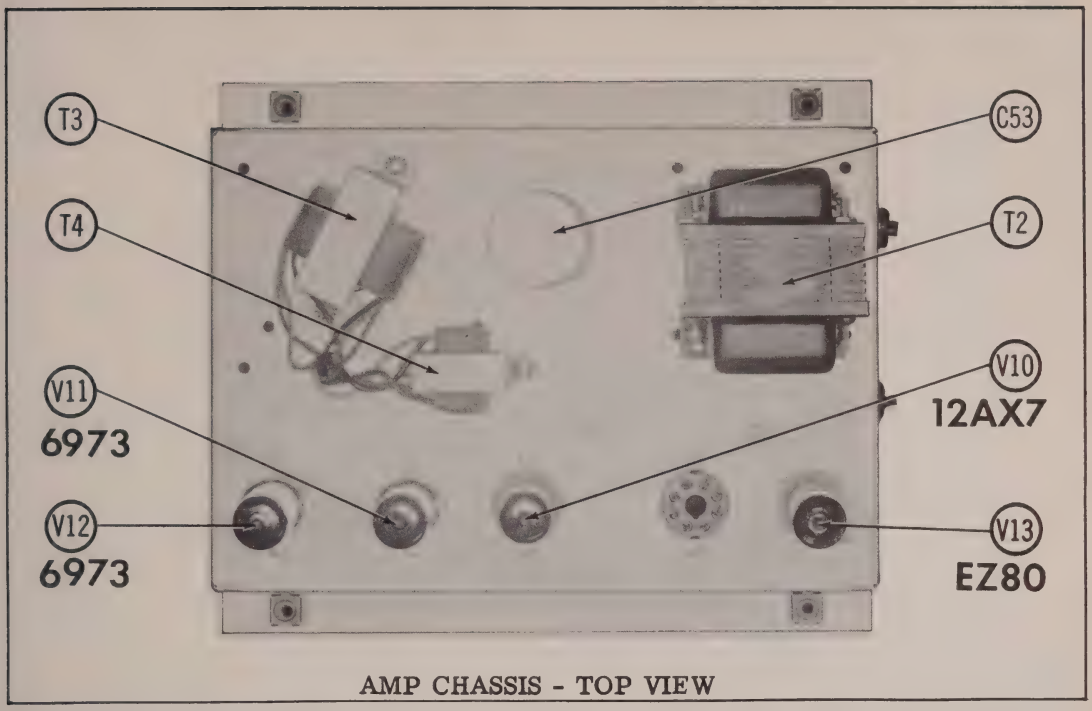
MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M8	Switch	19B670	Function (Rotary Type)

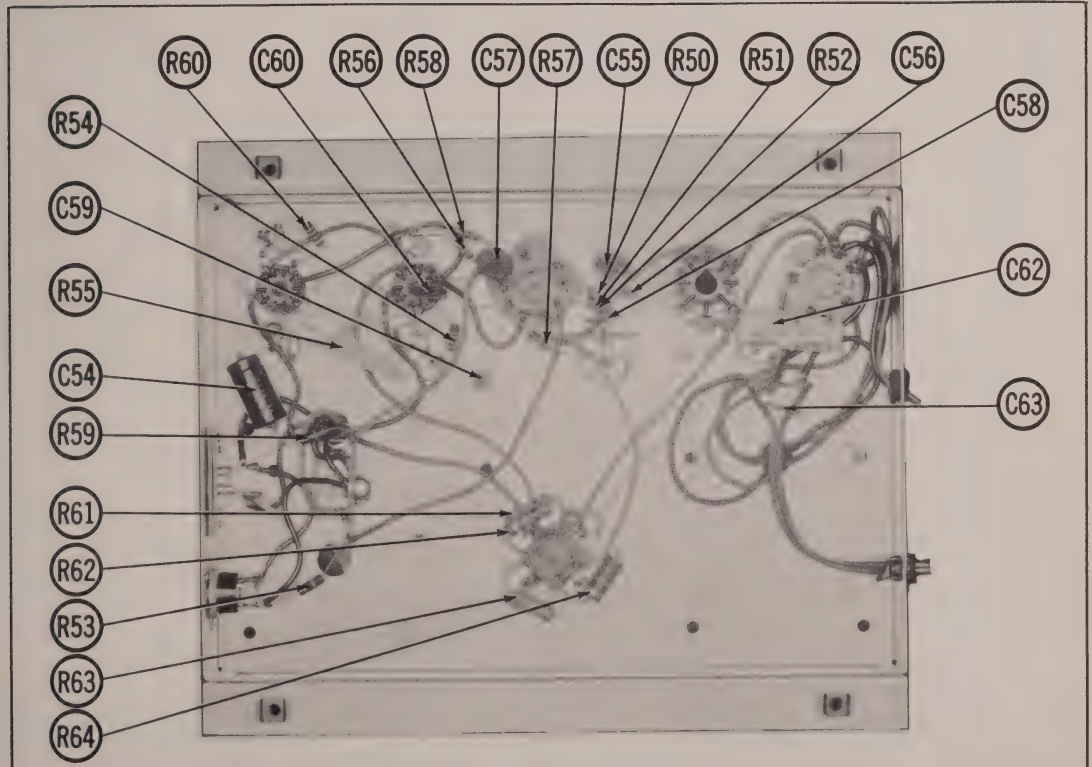
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B509	FM-AM, Tuning, AFC Switch
Knob	8B506	Block (outer) Loudness
Knob	8B507	Block (inner) Balance
Knob	8B508	Treble, Bass, Function
Cabinet	17B835	Mahogany, Model 955
Cabinet	17B836	Walnut, Model 955
Cabinet	17B837	Blonde, Model 955
Cabinet	17B832	Mahogany, Model 953
Cabinet	17B833	Walnut, Model 953
Cabinet	17B834	Blonde, Model 953
Cabinet	17B838	Fruitwood, Model 957



AMP CHASSIS - TOP VIEW

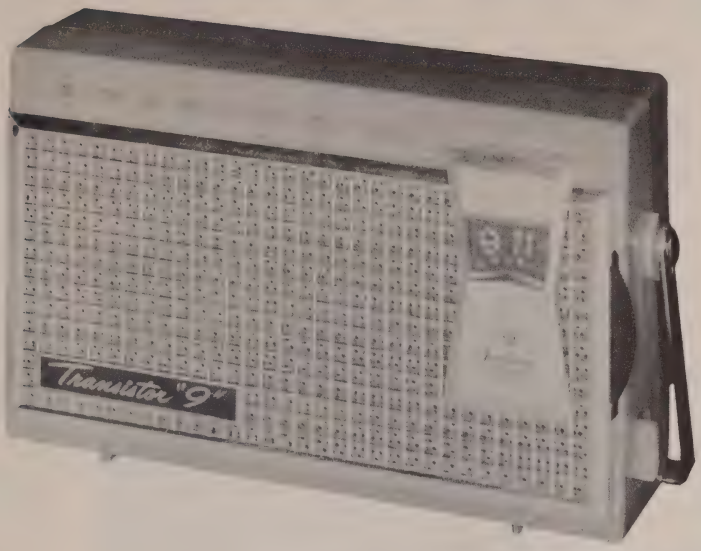


AMP CHASSIS - BOTTOM VIEW

PHOTOFACT® Folder with CIRCUITRACE®

EMERSON MODEL
911 (Ch. 120486)

EMERSON MODEL
911 (Ch. 120486)



TRADE NAME	Emerson Model 911 (Ch. 120486)		
MANUFACTURER	Emerson Radio & Phono Corp., 524 W. 23rd Street, New York 11, N. Y.		
TYPE SET	Battery Operated Transistorized Portable AM Receiver		
POWER SUPPLY	6 Volts DC	RATING	15 MA @ 6 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 – 1640KC		25 MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A4, A5, A6..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400% Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1640KC	"	"	A4	"
3.	"	1400KC	1400KC Signal	"	A5, A6	"
4.	"	600KC	600KC Signal	"	A7	Adjust for maximum output while rocking tuning gang.
5.	"	"	"	"	A8	Adjust for maximum output. Repeat Step 2.

DISASSEMBLY

1. Insert coin in slot at bottom of cabinet and twist. Remove rear cover.
2. Remove batteries.
3. Remove 3 Phillips head screws from ends of printed board.
4. Locate battery connector strip at battery end of printed board. Hold strip aside and remove chassis from cabinet.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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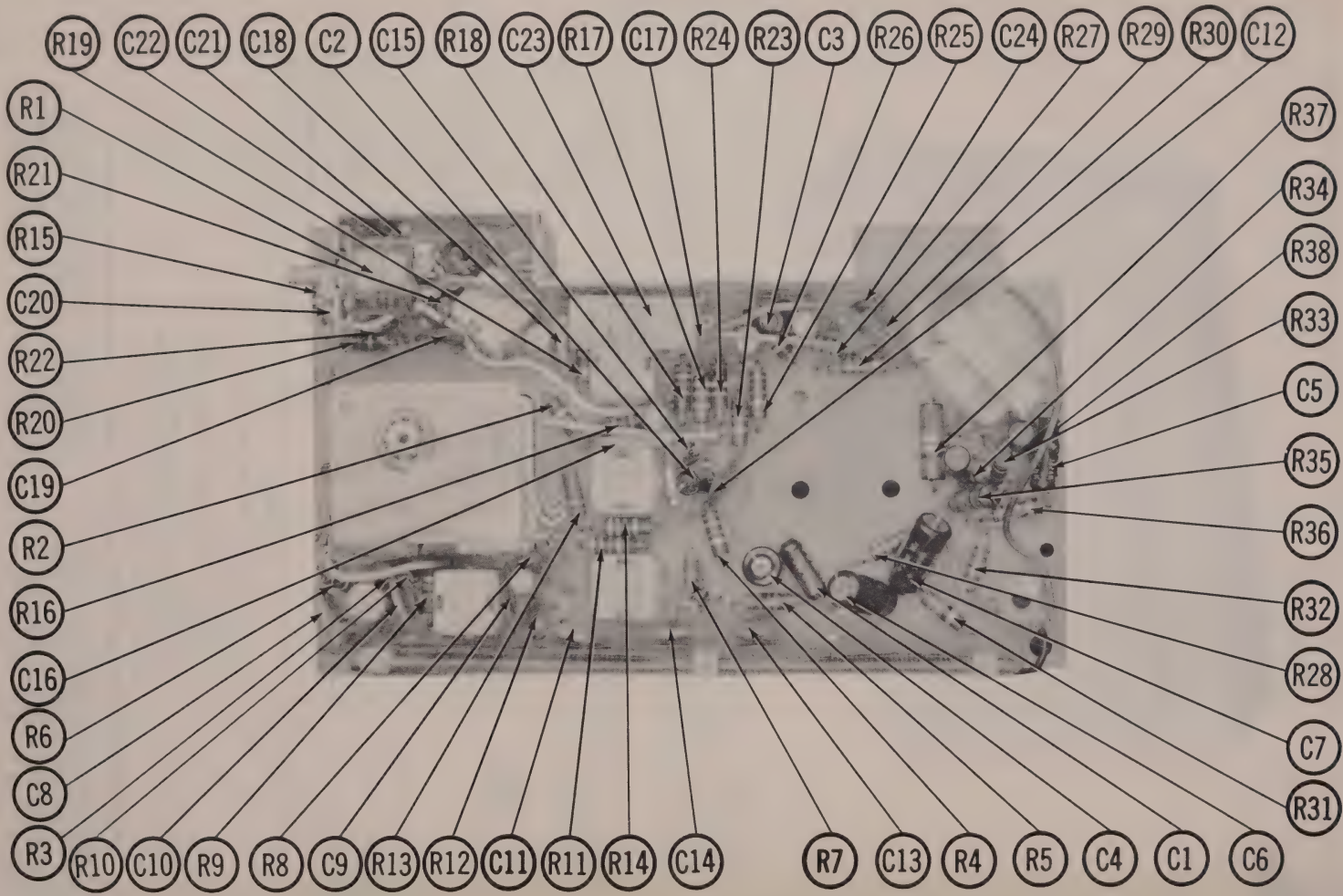
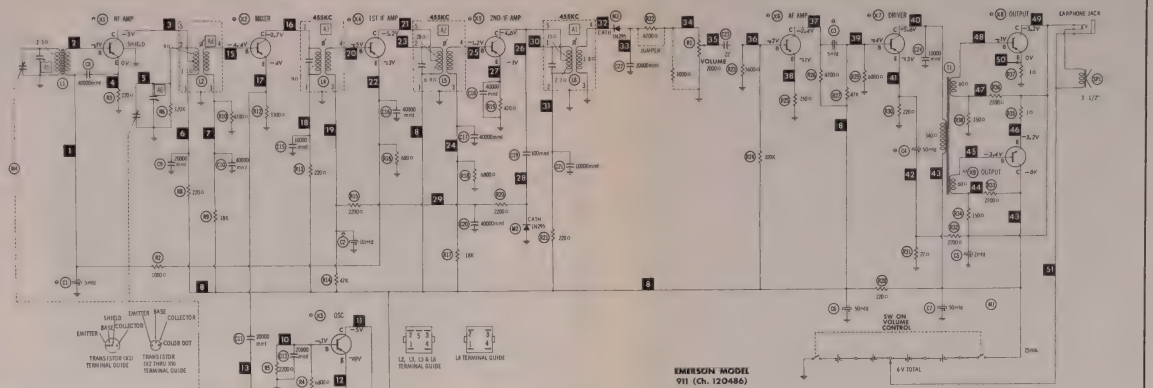
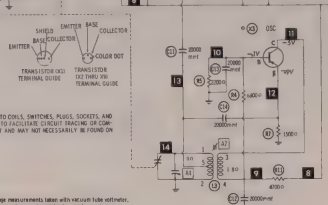
JF933

SET496 FOLDER 8



CHASSIS TOP VIEW





EMERSON MODEL 911 (Ch. 120486)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
5. Volume control at maximum, no signal applied for voltage measurements

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

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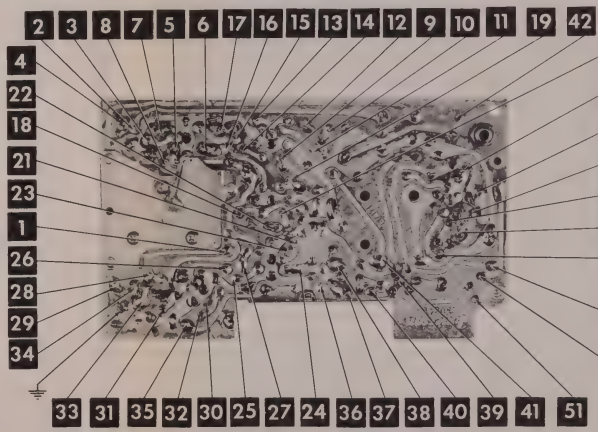

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PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	MFGR. PART NO.	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	815064	RF Amp. (2N544)		2N544	2N487	2N544	PNP
X2	815065 *	Mixer (2N412)		2N412	2N486	2N412	PNP
X3	815067 †	Oscillator (2N410)		2N410	2N485	2N410	PNP
X4	815067	1st IF Amp. (2N410)		2N410	2N483	2N410	PNP
X5	815068	2nd IF Amp. (2N410)		2N410	2N483	2N410	PNP
X6	815069	AF Amp. (2N406)		2N406	2N362	2N406	PNP
X7	815070 ♦	Driver (2N406)		2N406	2N362	2N406	PNP
X8	815070 ♦	Output (2N408)		2N408	2N633	2N408	PNP } Matched Pair
X9	815070 ♦	Output (2N408)		2N408	2N633	2N408	PNP

Note: First 3 digets of original transistor Part Number may be replaced by letter "E".
* Some versions may use Part #815066.
† Some versions may use Part #815067A, 815068.
♦ Part Number includes letter suffix. When X7 has "A", X8 and X9 should have "C" or "B"; When X7 has "B", X8 and X9 should have "B"; When X7 has "C", X8 and X9 should have "A".

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	EMERSON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	5	10		XPP-10005	NLW5-15	TT12X5	ML5-15	TE-1127	①
C2	10	10		XPP-10010	NLW10-10	TT12X10	ML10-15	TE-1114	②
C3	5	10		XPP-10005	NLW5-15	TT12X5	ML5-15	TE-1127	③
C4	50	10	925491	XPP-10050	NLW50-10	TT10X50	ML50-15	TE-1119	④
C5	2	6	925487	XPP-6002	NLW 2-5	TT6X2	ML2-6	TE-1081	
C6	50	10	925491	XPP-10050	NLW 50-10	TT10X50	ML50-5	TE-1119	
C7	50	10	925491	XPP-10050	NLW50-10	TT10X50	ML50-5	TE-1119	

① Some versions may use 2mfd in this application (Part #925489).
② Some versions may use 2mfd in this application (Part #925486).
③ Some versions may use 2mfd in this application (Part #925493).
④ Some versions may use 2mfd in this application (Part #925490).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA						
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C8	40000		BPD-05	DD-403	BYB6S4		GP140	5HK-S40	
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C10	40000		BPD-05	DD-403	BYB6S4		GP140	5HK-S40	
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C14	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20	
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10	
C16	40000		BPD-05	DD-403	BYB6S4		GP140	5HK-S40	

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C17	40000		BPD-05	DD-403	BYB6S4		GP140	5HK-S40
C18	40000		BPD-05	DD-403	BYB6S4		GP140	5HK-S40
C19	100		BPD-0001	DD-101	L10T10	CCD-101	GP310	10TS-T10
C20	40000		BPD-05	DD-403	BYB6S4		GP140	5HK-S40
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	20000		BPD-02	DD-203	BYA10S2	CCD-203	B-120	5HK-S20
C23	.22 50V		P288N-22		CUB2P22	IDP-3-224	GEM-2022	2TM-P22
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A B	2000Ω Switch	1/4	390611					Volume Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	1000Ω	
R3	220Ω	
R4	6800Ω	
R5	2200Ω	
R6	120K	
R7	1500Ω	
R8	220Ω	
R9	18K	
R10	4700Ω	
R11	4700Ω	
R12	3300Ω	
R13	220Ω	
R14	47K	

ITEM No.	RATING	REMARKS
R15	2200Ω	
R16	680Ω	
R17	18K	
R18	6800Ω	
R19	470Ω	
R20	2200Ω	
R21	220Ω	
R22	4700Ω	
R23	5600Ω	
R24	100K	
R25	150Ω	
R26	4700Ω	
R27	47K	

ITEM No.	RATING	REMARKS
R28	220Ω	
R29	6800Ω	
R30	220Ω	
R31	27Ω	
R32	2200Ω	
R33	2700Ω	
R34	150Ω	
R35	1Ω	
R36	2700Ω	
R37	1Ω	
R38	150Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		EMERSON PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	700157						
L2	RF Coil	720357						
L3	Osc. Coil	716135						
L4	1st IF Trans.	720354						
L5	2nd IF Trans.	720355						
L6	3rd IF Trans.	720356						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA EMERSON PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2	1 SEC. 2 1	734185						

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	3½"	PM	14-16Ω	180213		

BATTERIES

ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	EVEREADY "A"	EVEREADY "B"	MALLORY "A"	MALLORY "B"	NOTES
M1	1.5V	818122 *		930 *		1015 *		M-15R*	* 4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA EMERSON PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N295	817075	1N295	1N295	1N295	AVC Rectifier
M3	1N295	817075	1N295	1N295	1N295	Detector

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M4	Tuning Cap. Printed Board	900196 630249	

CABINETS & CABINET PARTS

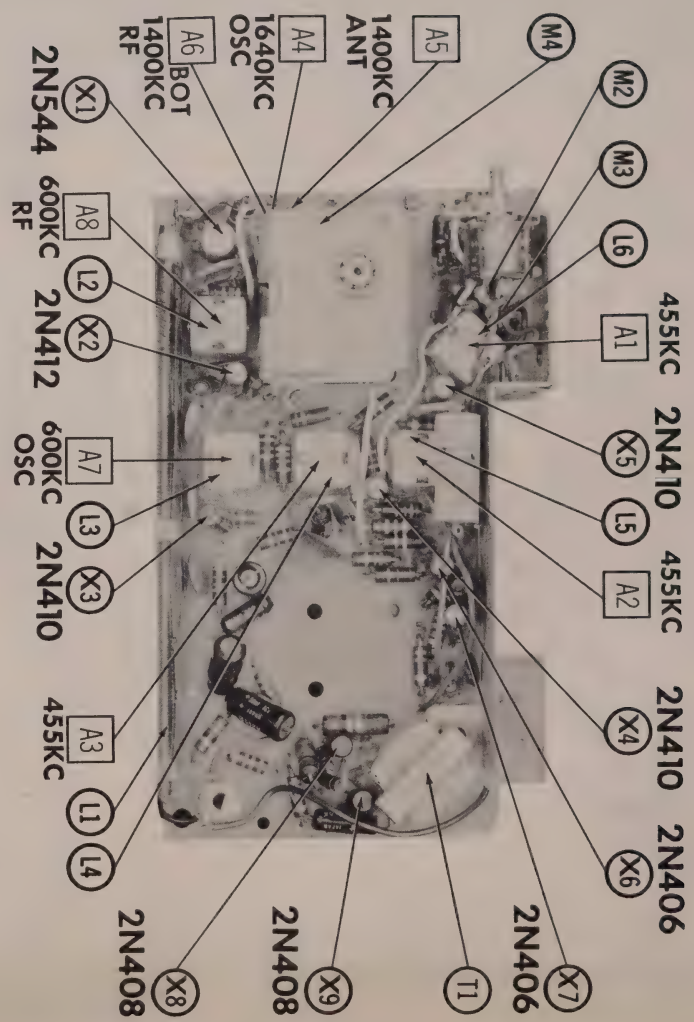
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	461194	Tuning (Coral)
Knob	460759K	Volume (Ebony)
Knob	460759L	Volume (Charcoal Grey)
Knob	460759M	Volume (Coral)
Knob	460759P	Volume (Ivory)
Knob	460759R	Volume (Gold)
Knob	460759S	Volume (Turquoise)
Cabinet	141049	Ebony
Cabinet	141049A	Charcoal Grey
Cabinet	141049B	Coral
Cabinet	14149C	Ivory
Cabinet	141049D	Gold
Cabinet	141049E	Turquoise
Cabinet Back	141057	Ebony
Cabinet Back	141057A	Charcoal Grey
Cabinet Back	141057B	Coral
Cabinet Back	141057C	Ivory
Cabinet Back	141057D	Gold
Cabinet Back	141057E	Turquoise

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

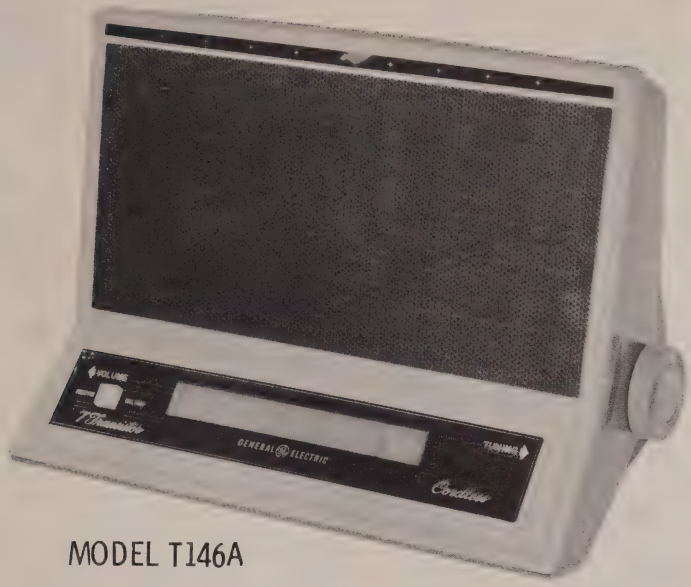
CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

GENERAL ELECTRIC MODELS T145A, T146A

GENERAL ELECTRIC
MODELS T145A, T146A



MODEL T146A

GENERAL ELECTRIC
MODELS T145A, T146A

TRADE NAME	General Electric Models T145A, T146A
MANUFACTURER	General Electric Co., Product Service, Radio Receiver Dept., 869 Broad Street, Utica, N. Y.
TYPE SET	Battery Operated Transistorized AM Receiver
POWER SUPPLY	4.5 Volts DC RATING 18 MA @ 4.5 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	535 - 1620KC 30 MA @ 4.5 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A1, A2, A3.....GENERAL CEMENT #9440
A4, A5.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1620KC	"	"	A4	"
3.	"	1400KC	1400KC Signal	"	A5	Adjust for maximum output while rocking tuning gang.

DISASSEMBLY

1. Remove knobs.
2. Remove 2 screws from cabinet bottom.
3. Remove screw from recessed hand grip in top of cabinet.
4. Separate cabinet front from back.
5. Unsolder speaker leads.
6. Remove screws holding mounting plate to cabinet front.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KG014

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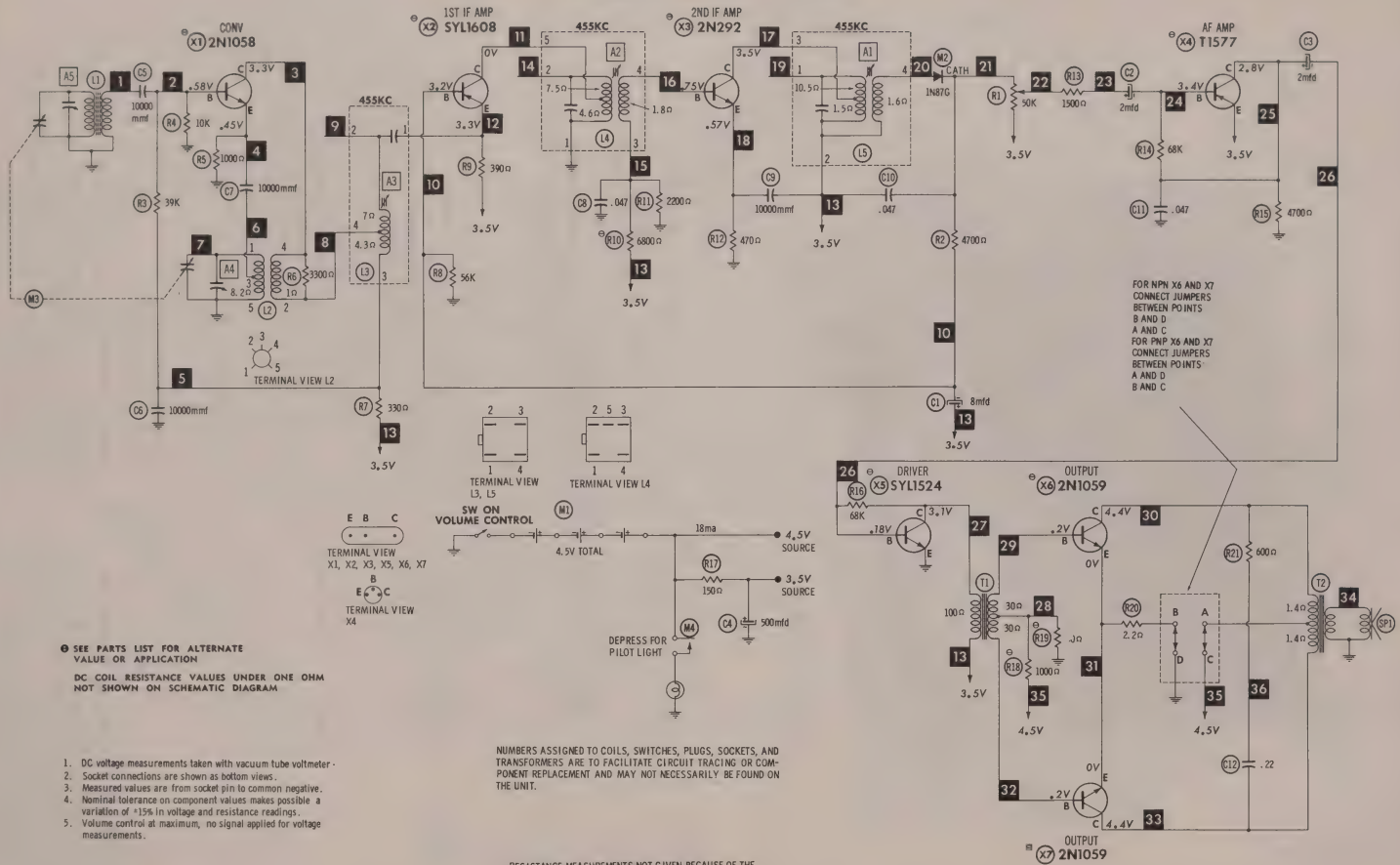
SET 496 FOLDER 9



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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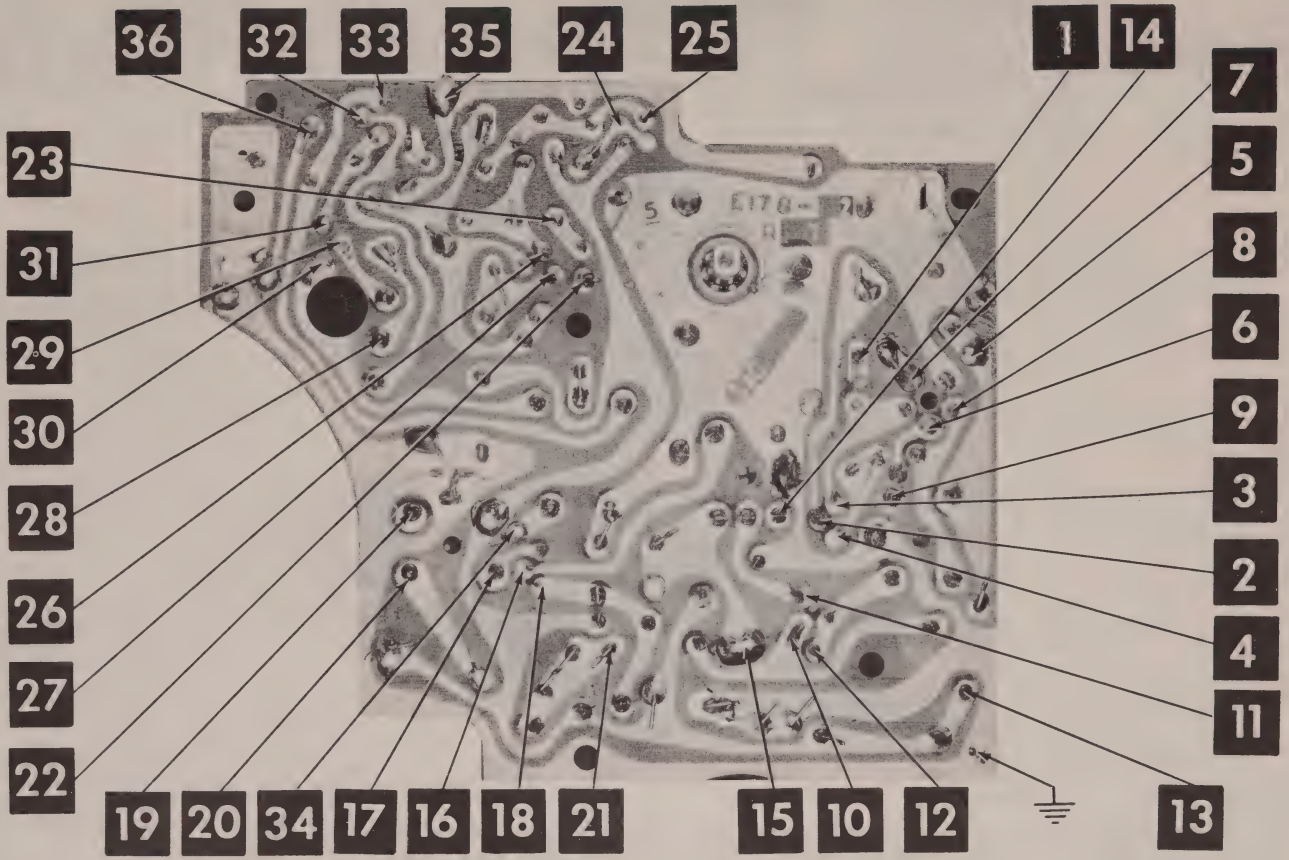
GENERAL ELECTRIC MODELS T145A, T146A



A Howard W. Sams CIRCUITRACE Photo

PRINTED BOARD

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	2N1058 ①	Converter	2N377		2N1366	2N1058	NPN
X2	SYL1608 ②	1st IF Amplifier			2N483	SYL1608	PNP
X3	2N292 ③	2nd IF Amplifier			2N1367	2N292	NPN
X4	T1577 ④	AF Amplifier		2N406	2N362	2N109	PNP
X5	SYL1524 ⑤	Driver		2N649		2N1059	NPN
X6	2N1059 ⑥	Output	2N444	2N649		2N1059	NPN } Matched
X7	2N1059 ⑥	Output	2N444	2N649		2N1059	NPN } Pair

① Some versions may use type SYL1297 in this application.
② Some versions may use type GT760R, 4JX1A813 in this application.
③ Some versions may use type 2N293, 2N1121 in this application.
④ Some versions may use type 2N191, 4JX1E821 in this application.
⑤ Some versions may use type 2N1059-1, 4JX2816, 4JX2825 in this application.
⑥ Some versions may use type 4JX1E850 (PNP) in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT.	REPLACEMENT DATA: G.E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	8	10	RS-1592	PWE10008	NLW8-12	TT25X8	ML8-15	TE-1127.3	
C2	2	10	RS-1959	XPP-10002	BBR2-50	PET1930	ML2-15	TE-1121	
C3	2	10	RS-1959	XPP-10002	BBR2-50	PET1930	ML2-15	TE-1121	
C4	500	6	RS-1960	PRS1120	BR500-6	TC605	TD-500-6	TVA-1103	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S1
C8	.047 50V		P288N-047	DD-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C11	.047 50V		P288N-047	DD-503	CUB2S47	DP-2-473	GEM-4147	2TM-S47
C12	.22 50V		P288N-22		CUB2P22	DP-3-224	GEM-2022	2TM-P22

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: G.E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	50K	½	RS-2464	B-32	A47-50K-Z	Q13-123	U33	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KR-1	SWE-12	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	4700Ω	
R3	39K	
R4	10K	
R5	1000Ω	
R6	3300Ω	
R7	330Ω	
R8	56K	

ITEM No.	RATING	REMARKS
R9	390Ω	
R10	6800Ω	Note 1
R11	2200Ω	
R12	470Ω	
R13	1500Ω	
R14	68K	
R15	4700Ω	

ITEM No.	RATING	REMARKS
R16	68K	
R17	150Ω	
R18	1000Ω	Note 2
R19	50Ω	Note 3
R20	2.2Ω	
R21	600Ω	

Note 1. Used with X3 transistor type 2N292 or 2N293; 8200Ω used with type 2N121, 10K used with Part #RS2356.
Note 2. R18 is 50Ω when PNP type output transistors are used.
Note 3. Temperature compensating. R19 is 1000Ω when PNP type output transistors are used.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: G.E. PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loopstick	RS-2467						
L2	Osc. Coil	RS-1964						
L3	1st IF Trans.	RS-1424						
L4	2nd IF Trans.	RS-1965						
L5	3rd IF Trans.	RS-1966						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO: PRI.	TURNS RATIO: SEC.	REPLACEMENT DATA: G.E. PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1	1	RS-1961						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	80Ω CT	3-4Ω	RS-1962							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	RB-1046	52A21	

BATTERIES

ITEM No.	VOLTAGE	G. E. PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	*		* 230		* A100		*M-13R	* 3 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		G. E. PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N87G	RS-1811	1N60	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Tuning Cap.	RS-2465	2 Gang
M4	Switch	RS-2460	Pilot Light Off-On, Includes Bracket, Contact, & Insulator

CABINETS & CABINET PARTS

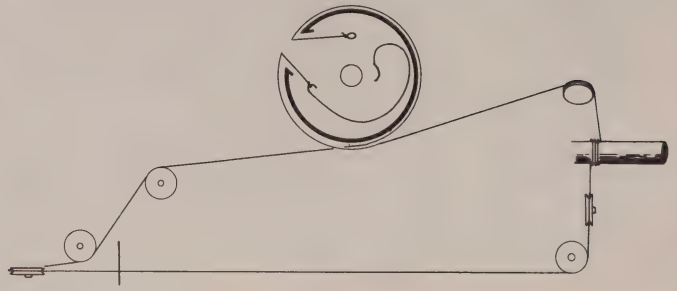
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

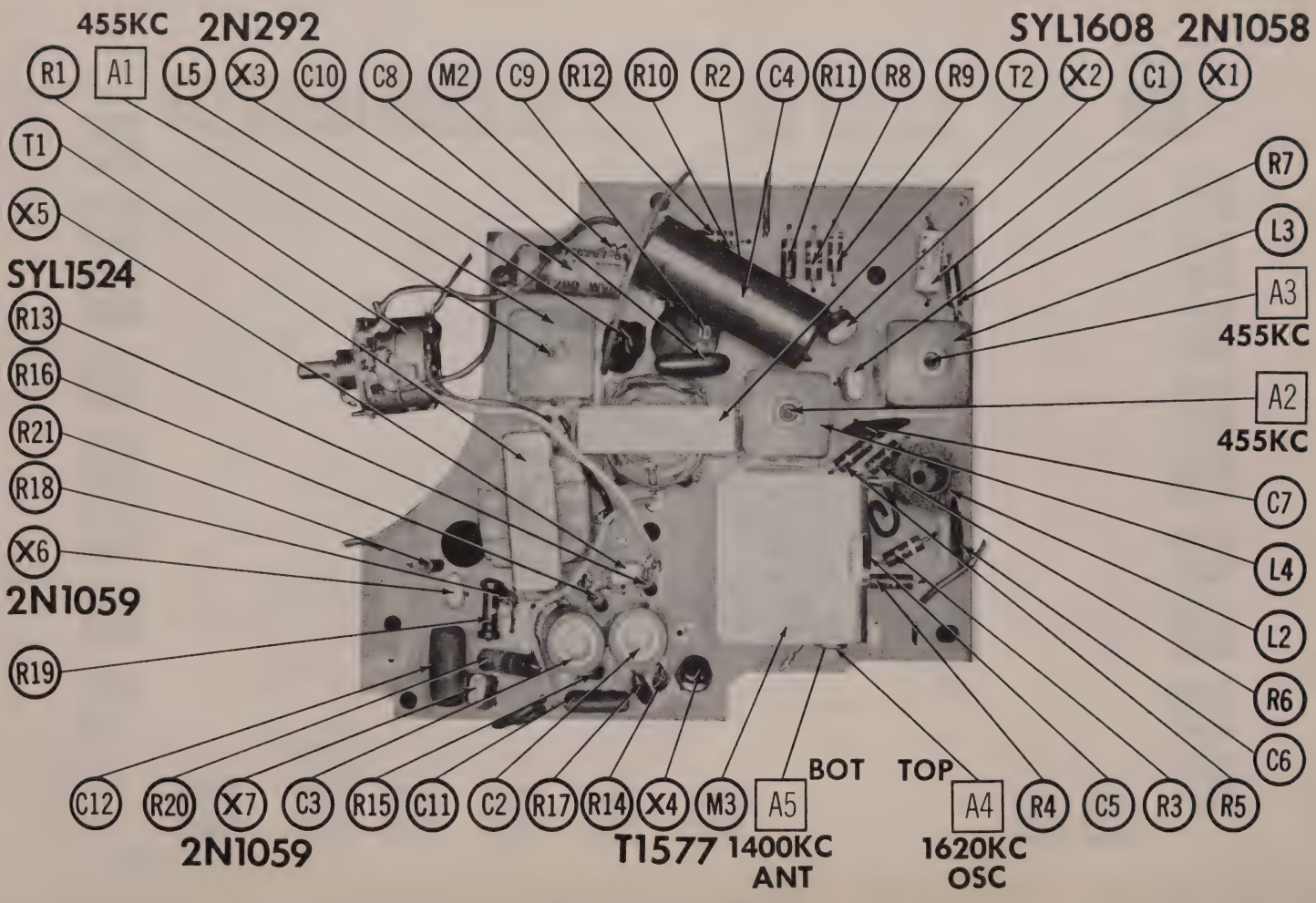
NAME	PART NO.	DESCRIPTION
Knob	RS-2450	Tuning, Model T146A
Knob	RS-2468	Tuning, Model T145A
Knob	RS-2451	Volume, Model T146A
Knob	RS-2469	Volume, Model T145A
Pointer	RS-2453	
Cabinet Front	RB-1144	
Cabinet Back	RB-1145	Model T146A
Cabinet Back	RB-1146	Model T145A

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

DIAL CORD STRINGING



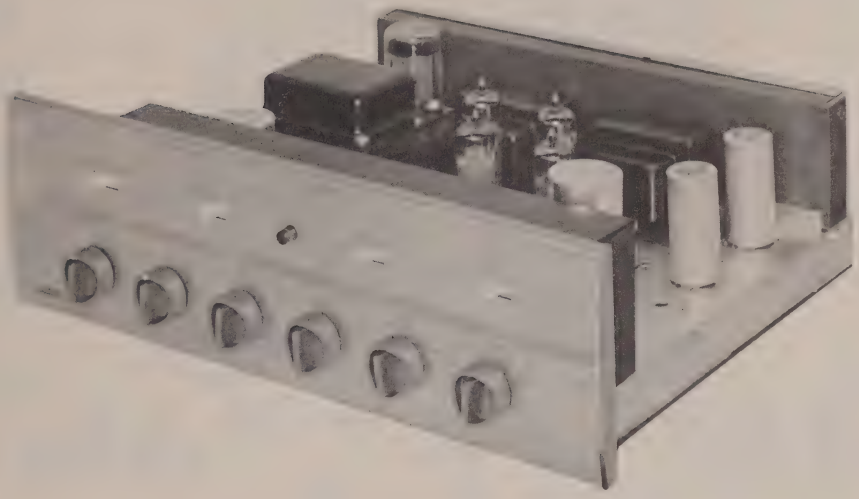


CHASSIS TOP VIEW

PHOTOFACT® Folder

HARMAN-KARDON
MODEL A-230

HARMAN-KARDON
MODEL A-230



HARMAN-KARDON
MODEL A-230

TRADE NAME	Harman-Kardon Model A-230 (The Ballad)
MANUFACTURER	Harman-Kardon, Inc., 520 Main Street, Westbury, L. I., N. Y.
TYPE SET	AC Operated 10 Tube Stereo Amplifier
POWER SUPPLY	105 - 125 Volts AC, 60 Cycles RATING 125 Watts, .94 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel Preamp. - Right Channel Preamp.	ECC83/12AX7
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AU7/ECC82
V3	Left Channel AF Amp. - Right Channel AF Amp.	12AU7/ECC82
V4	Left Channel AF Amp. - Left Channel Phase Inv.	ECC83/12AX7
V5	Left Channel Output	EL84/6BQ5
V6	Left Channel Output	EL84/6BQ5
V7	Right Channel AF Amp. - Right Channel Phase Inv.	ECC83/12AX7
V8	Right Channel Output	EL84/6BQ5
V9	Right Channel Output	EL84/6BQ5
V10	Rectifier	GZ34/5AR4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Harman-Kardon PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	JE2202842	AFH2-58	C0355	FP239	TMD-56	TVL-2766	
B	▲50	350							
C2A	▲40	300	JE2362695	AFH4-71-25	C0194	FP423.4	TMT-112	TVLS-4560.5*	
B	■40	300			BR1005	TC77	TD-100-25		
C	▲100	25							
D	100	25							
C3	50	12	JE2382923	SRE12V50	BBR50-25	TT15X50	TD-50-25	TVA-1206	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

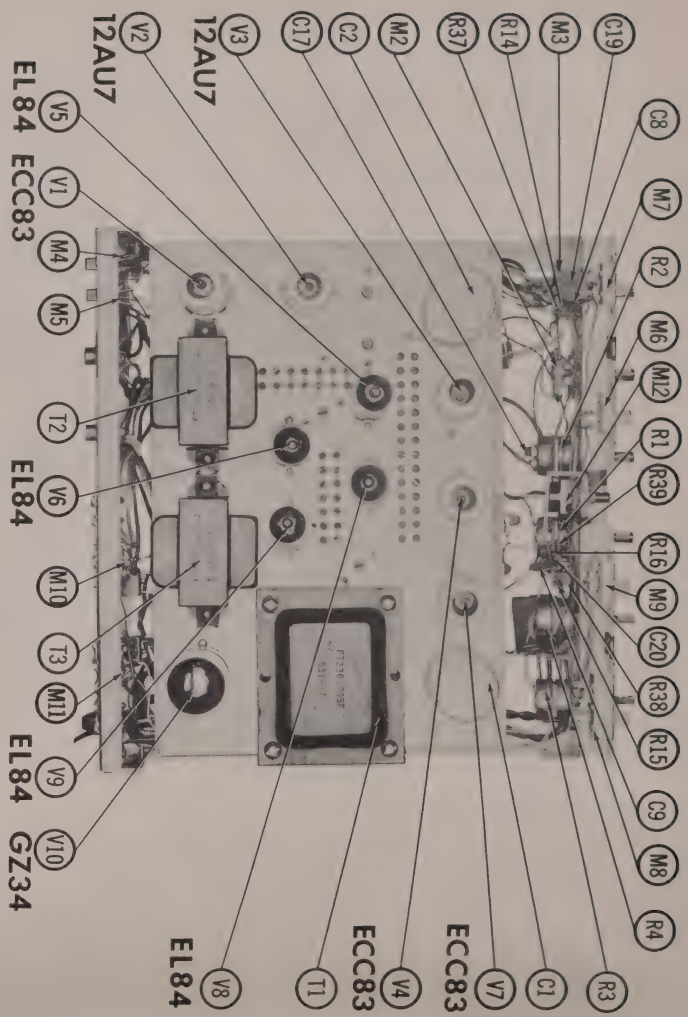
ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S 20
C6	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C7	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	100 N150					*		10TCP-T10
C12	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C14	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C15	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C16	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C17	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C18	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C19	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	100 N150					*		10TCP-T10
C23	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C24	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C25	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg*		RV3063500					Loudness, Left Channel
B	1meg*							Loudness, Right Channel

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Harman-Kardon PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R2A	2meg		RV3063498	B-75	AD47-2meg-S		FA26L	Balance, Left Channel
B	2meg			SR-75	Not Req.		RU26L	Balance, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R3A	500K		RV3063499					Treble, Left Channel
B	500K							Treble, Right Channel
R4A	500K		RV3063499					Bass, Left Channel
B	500K							Bass, Right Channel
R5	100Ω		RVCOM2569	B-1			U1	Output Balance, Left Chann
R6	100Ω		RVCOM2569	B-1			U1	Output Balance, Right Chann
R7A	100Ω		RV2362690	B-1			U1	Hum Adjust, Left Channel
B	100Ω			B-1			U1	Hum Adjust, Right Channel

* Taps at 300K and 600K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	22K	
R9	470K	
R10	3.3meg	
R11	120K	
R12	1200Ω	
R13	39K	
R14	22K	
R15	27K	
R16	68K	
R17	150K	
R18	270K	
R19	10meg	
R20	180K	
R21	150K	
R22	39K	
R23	680Ω	

* Alternate

ITEM No.	RATING	REMARKS
R24	470K	
R25	470K	
R26	270Ω 1W	(330Ω) *
R27	270Ω 1W	(330Ω) *
R28	1000Ω	
R29	1000Ω	
R30	10K 1W	
R31	10K 1W	
R32	22K	
R33	470K	
R34	3.3meg	
R35	120K	
R36	39K	
R37	22K	
R38	27K	
R39	68K	

ITEM No.	RATING	REMARKS
R40	150K	
R41	270K	
R42	10meg	
R43	180K	
R44	150K	
R45	39K	
R46	680Ω	
R47	470K	
R48	470K	
R49	270Ω 1W	(330Ω) *
R50	270Ω 1W	(330Ω) *
R51	1000Ω	
R52	1000Ω	
R53	1000Ω 2W	

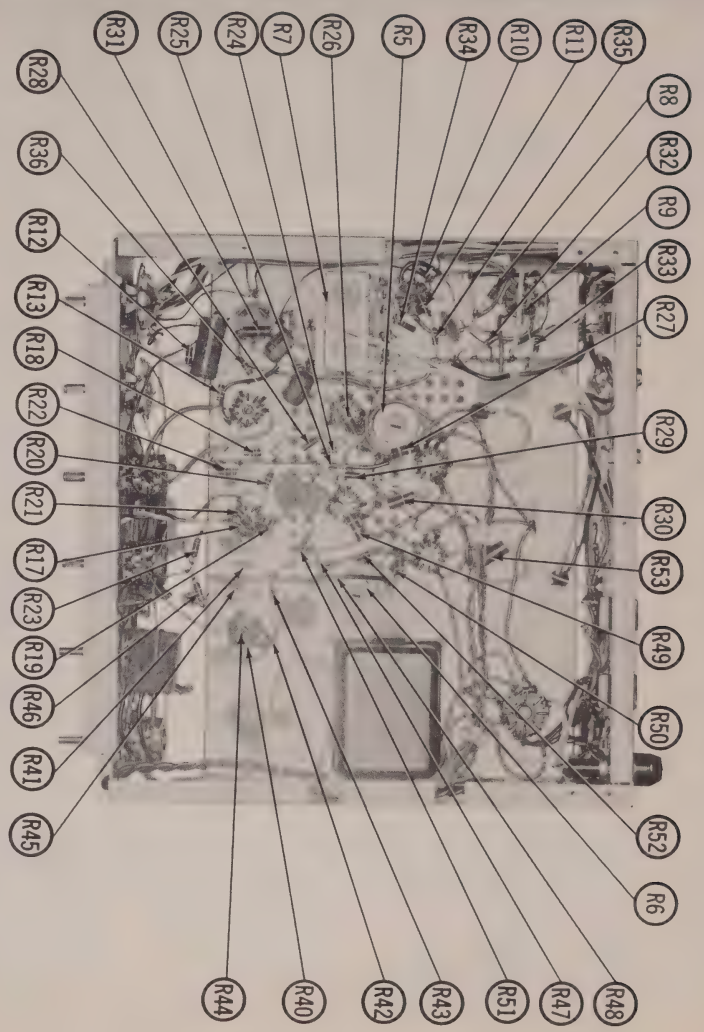
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Harman-Kardon PART No.	REPLACEMENT DATA
K1	Preamp. Cathode	500mmf, 2000mmf, 1800Ω, 32K, 47K, 150K	PCOM3248	Sprague TC-25
K2	Tone Comp.	750mmf, 3000mmf, 3400mmf, 15000mmf, 27K, 120K	PC2492902	Sprague TC-22
K3	Preamp. Cathode	500mmf, 2000mmf, 1800Ω, 32K, 47K, 150K	PCOM3248	Sprague TC-25
K4	Tone Comp.	750mmf, 3000mmf, 3400mmf, 32K, 47K, 150K	PC2492902	Sprague TC-22

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .94A	540 VCT @ .160A	5V @ 1.9A	FT2362705						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 2.2A	6.3V@ 2.4A								

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Harman-Kardon PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6500Ω CT	16Ω Tap @ 8Ω	FT3063460-A ①							
T3	6500Ω CT	16Ω Tap @ 8Ω	FT3063460-A ①							

① Alternate Part #FT3063460.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA Harman-Kardon PART No. FUSE	Harman-Kardon PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A 250V			312002 (3AG 2A 250V)	342001	AGC 2	HKP

MISCELLANEOUS

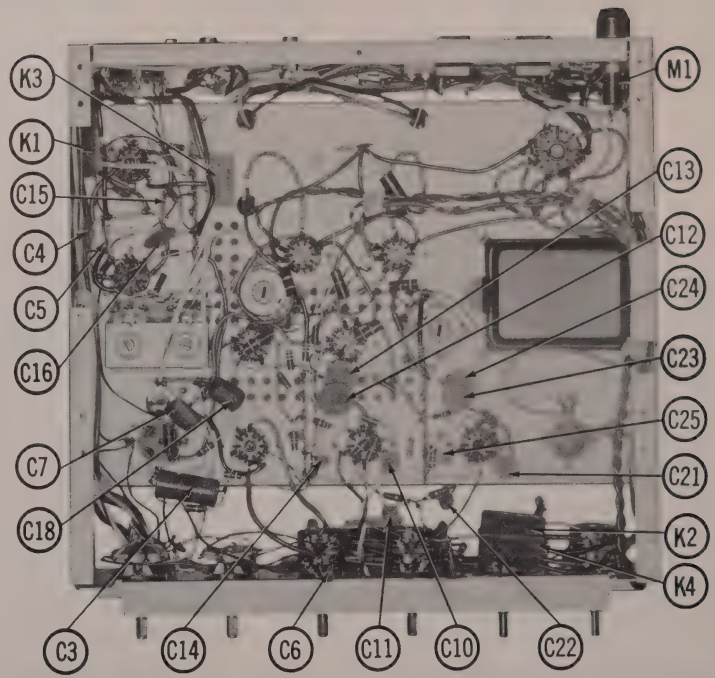
ITEM No.	PART NAME	Harman-Kardon PART No.	NOTES
M2	Switch	ER3063501	Mode
M3	Switch	ER2363340	Function
M4	Switch	ES771372	Equalization (Phono) (SPDT, Slide-Type)
M5	Switch	ES771372	Equalization (Tape) (SPDT, Slide Type)
M6	Switch	ESCOM2727	Contour (DPDT, Slide Type)
M7	Switch	ESCOM2727	Rumble Filter (DPDT, Slide Type)
M8	Switch		Speaker Selector (DP 3 position, Slide Type)
M9	Switch	ESCOM2727	Stereo Speaker Selector (DPDT, Slide Type)
M10	Switch	ESCOM2727	Speaker Impedance (DPDT, Slide Type)
M11	Switch	ESCOM2727	Speaker Phasing (DPDT, Slide Type)
M12	Switch		Power Off-On, Pushbutton Type

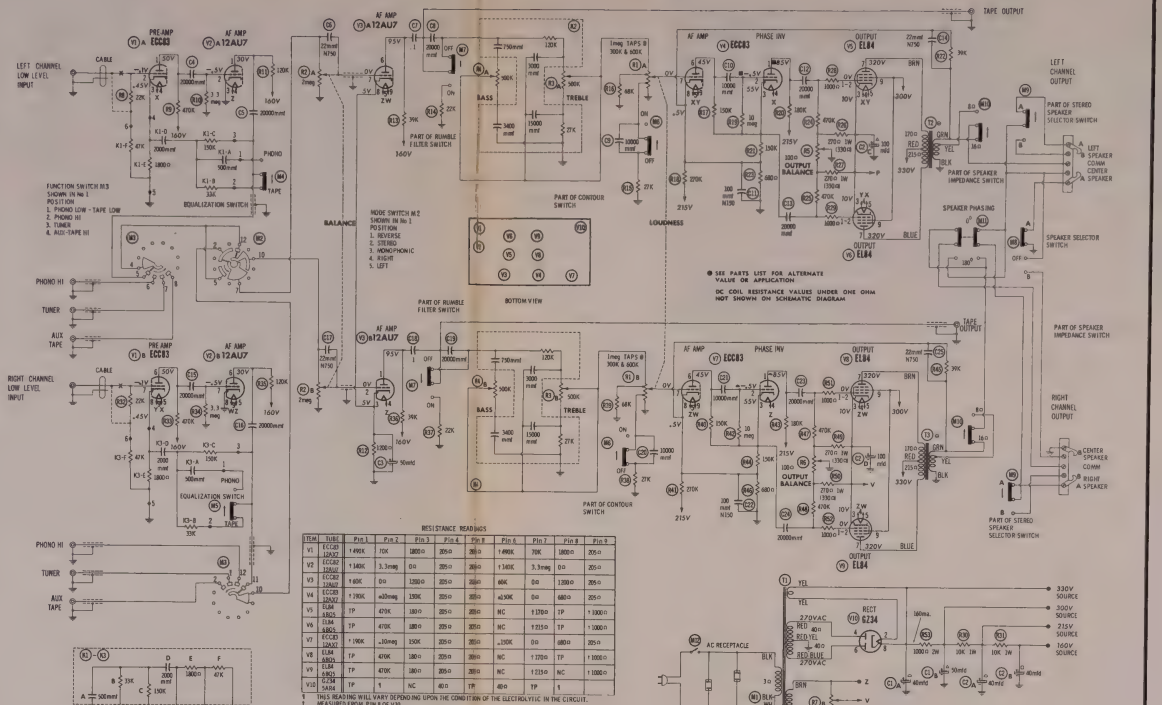
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	ECC83 12AX7	1.490K	70K	1800Ω	205Ω	205Ω	1.490K	70K	1800Ω	205Ω
V2	ECC83 12AU7	1.140K	3.3meg	0Ω	205Ω	205Ω	1.140K	3.3meg	0Ω	205Ω
V3	ECC83 12AU7	1.60K	0Ω	1250Ω	205Ω	205Ω	60K	0Ω	1250Ω	205Ω
V4	ECC83 12AX7	1.190K	∞20meg	150K	205Ω	205Ω	∞50K	0Ω	680Ω	205Ω
V5	EL84 6BQ5	TP	470K	180Ω	205Ω	205Ω	NC	1.170Ω	TP	1.100Ω
V6	EL84 6BQ5	TP	470K	180Ω	205Ω	205Ω	NC	1.215Ω	TP	1.100Ω
V7	ECC83 12AX7	1.190K	∞20meg	150K	205Ω	205Ω	∞150K	0Ω	680Ω	205Ω
V8	EL84 6BQ5	TP	470K	180Ω	205Ω	205Ω	NC	1.170Ω	TP	1.100Ω
V9	EL84 6BQ5	TP	470K	180Ω	205Ω	205Ω	NC	1.215Ω	NC	1.100Ω
V10	GZ34 5AR4	TP	1	NC	40Ω	TP	40Ω	TP	1	

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
1 MEASURED FROM PIN 8 OF V10.
∞ MEASURED FROM PIN 3 OF V4.
■ MEASURED FROM PIN 3 OF V7.

NC - NO CONNECTION
TP - TIE POINT

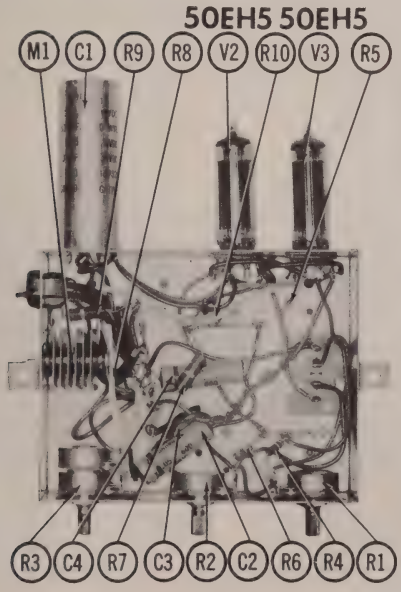
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

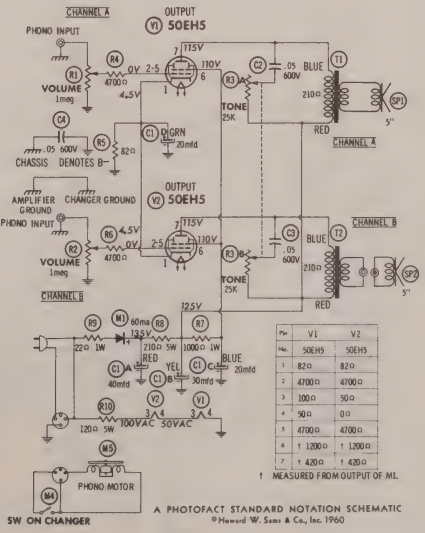
A PHOTOFACT STANDARD NOTATION SCHEMATIC
®Howard W. Sams & Co., Inc. 1960

HARMAN-KARDON
MODEL A-230

TRADE NAME	Harmony Model 220
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass.
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 -120 Volts, AC, 60 Cycles RATING 28 Watts, .3 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11





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HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Channel A Output	50EH5	V2	Channel B Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	HARMONY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	40	150	11G760	PR4-200	BBRQ44315C	WQ230	CDB-Q-1001	TVA-3448	
B	30	150						TVA-1410	
C	20	150							
D	20	25							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C3	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C4	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	HARMONY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	9G640	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel A
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	9G640	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel B
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	25K	½	9G641	B-26			FA253L	Tone, Channel B
B	25K	½		SR-26			RU253L	Tone, Channel A
C	Shaft			Not Req.			CS3500	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	4700Ω	
R5	82Ω	
R6	4700Ω	

ITEM No.	RATING	REMARKS
R7	1000Ω 1W	
R8	210Ω 5W	#16G449
R9	22Ω 1W	

ITEM No.	RATING	REMARKS
R10	120Ω 5W	#16G448

Harmony Part Number.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	HARMONY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	3G252	24853	A-3025	AU-605	A-3332	24853	S-12X	
T2	2400Ω	3-4Ω	3G252	24853	A-3025	AU-605	A-3332	24853	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	HARMONY PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	1G156	5A07	
SP2	5"	PM	3-4Ω	1G156	5A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	HARMONY PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.060A	10G616 *	T100 *	1235AH *	100A *	SR200 ♦	* Selenium Type ♦ Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	HARMONY PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		70TS (TB)		96					

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	HARMONY PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)		CRA57 † or CRA57D ♦	† Jewel ♦ Diamond
	(LP)		CRA-57X † or CRA-57XD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	HARMONY PART No.	NOTES
M4	Switch		Off-On (Part of Changer)
M5	Motor		Phono Drive (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Cabinet	17G875	Tan
Cabinet	17G874	Grey
Handle	18G695	Tan
Handle	18G696	Grey

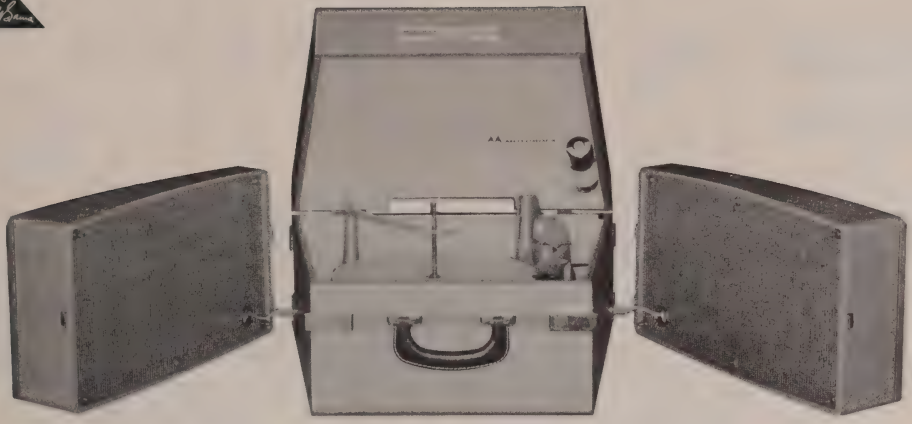
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

MOTOROLA MODELS SH16B, E (Ch. HS-763, HS-792)

MOTOROLA MODELS SH16B, E (Ch. HS-763, HS-792)

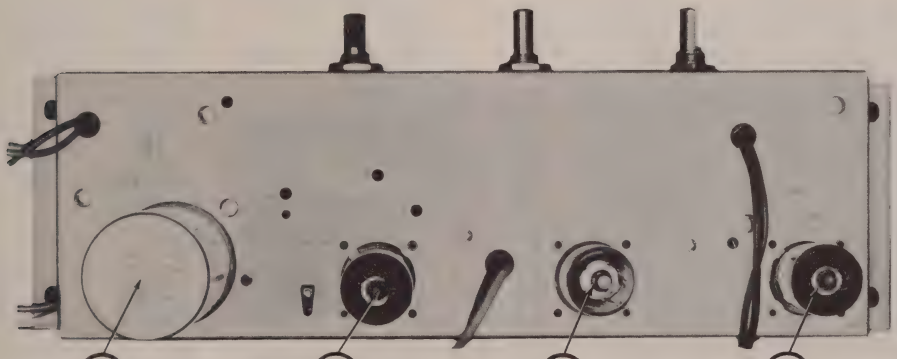


MODEL SH16B

TRADE NAME	Motorola Models SH16B, SH16E (Ch. HS-763, HS-792)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 4 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 40 Watts, .38 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER BR8RC — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11

MOTOROLA MODELS SH16B, E (Ch. HS-763, HS-792)



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KT114

SET 496 FOLDER 12

AMP PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor – Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Left Channel AF Amp. – Right Channel AF Amp.	12AX7A
V2	Left Channel AF Amp. – Left Channel Output	ECL82/6BM8
V3	Right Channel AF Amp. Right Channel Output	ECL82/6BM8

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲50	250	23K645880	AFH4-02-45	D0927	FP420.46	TMQ-143	TVL-4641	
B	■80	250							
C	20	250							
D	▲10	250							
C2	50	25	23K645866	PRS1265	BBR50-25	TC29	TD-50-25	TVA-1206	
C3	5	10NP	23B643970	NP-PRS7405	BBR4-150	TCN105		TVAS-1110 *	
C4	5	10NP	23B643970	NP-PRS7405	BBR4-150	TCN105		TVAS-1110 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C6	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C8	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C9	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C10	10000		BPD-01	DD-103	BYA1081	CCD-103	B-110	5HK-S10
C11	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C12	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C13	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C14	3000		BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C15	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C16	10000		BPD-01	DD-103	BYA1081	CCD-103	B-110	5HK-S10

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	18B644054					Loudness, Left Channel
	600K Tap							
B	2meg	½						Loudness, Right Channel
	600K Tap							
C	Switch							Push-Pull Stereo-Monaural
R2A	1meg	½	18K644053	B-68			FA16R	Tone, Right Channel
B	1meg	½		SR-68			RU16R	Tone, Left Channel
C	Shaft			Not Req.			CS3500	
R3	600K*	½	18B644051					Balance Note 1

Note 1. Some versions may use 550K Balance with 27.5K and 495K Stops (Part #18B644081).
* Stops @ 50K and 550K. Shaft has 90° rotation.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	68K	
R5	470K	(680K) *
R6	220K	
R7	820Ω	
R8	100K	
R9	33K	
R10	1meg	
R11	220K	
R12	2200Ω	

ITEM No.	RATING	REMARKS
R13	820K	
R14	680K	
R15	120Ω 2W	
R16	68K	
R17	470K	(680K) *
R18	220K	
R19	820Ω	
R20	100K	
R21	33K	

ITEM No.	RATING	REMARKS
R22	1meg	
R23	220K	
R24	2200Ω	
R25	820K	
R26	680K	
R27	120Ω 2W	
R28	4700Ω 2W	
R29	6800Ω	

* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	6600Ω	6-8Ω	25B645835	24S04	A-2900	AU-602	A-3856	24S04	S-51X	
T2	6600Ω	6-8Ω	25B645835	24S04	A-2900	AU-602	A-3856	24S04	S-51X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	6"	PM	6-8Ω	50K645230	6A15RZ8	
SP2	4"	PM	6-8Ω	50K645231	4A15Z8	
SP3	6"	PM	6-8Ω	50K645230	6A15RZ8	
SP4	4"	PM	6-8Ω	50K645231	4A15Z8	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M1	59B642691 † or 59K643765 ♦	13T	Not Req.	13	Not Req.	A-44X	Not Req.	10T2-S	Not Req.

† Sapphire
♦ Diamond

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA MOTOROLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M2	(Part of M1)	*W-204DS †♦ or *W-204DD-1♦	* A-44X † or * A-44XSD †♦ or * A-44XDD♦	* Includes Cartridge † Jewel ♦ Diamond

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C644049	Loudness, Tone
Knob	36K644050	Balance
Cabinet	16E645080	Model SH16B (Blue)
Cabinet	16K645081	Model SH16E (Charcoal)
Cabinet Handle	55K645048	Model SH16B (Black)
Cabinet Handle	55K645049	Model SH16E (White)

POWER PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V4	Rectifier	EZ80/6V4			

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T3	117V @ .38A	360 VCT @ .070A	6.3V @ .6A	25C645884C①						
	SEC. 3	SEC. 4	SEC. 5							
	6.3V @ 1.9A									

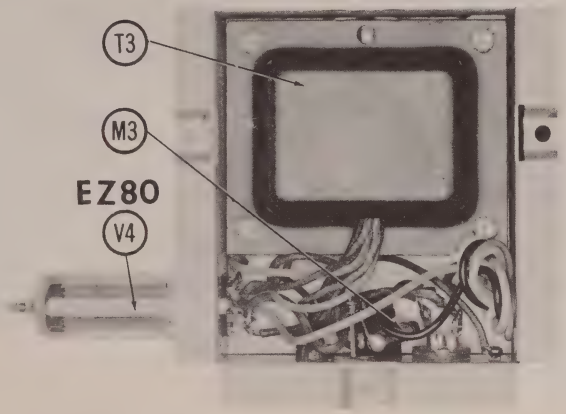
① Alternate Part #25C645884.

FUSES

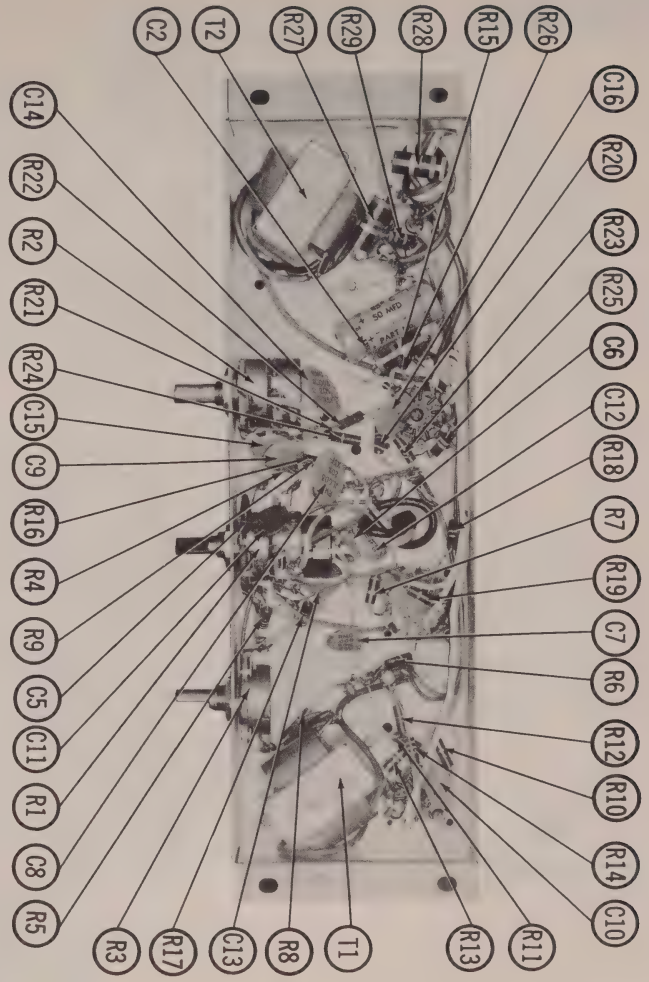
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	1A 125V S/B P/T	65K646113①		315001 (3AG 1A 125V) S/B P/T		MDV1	

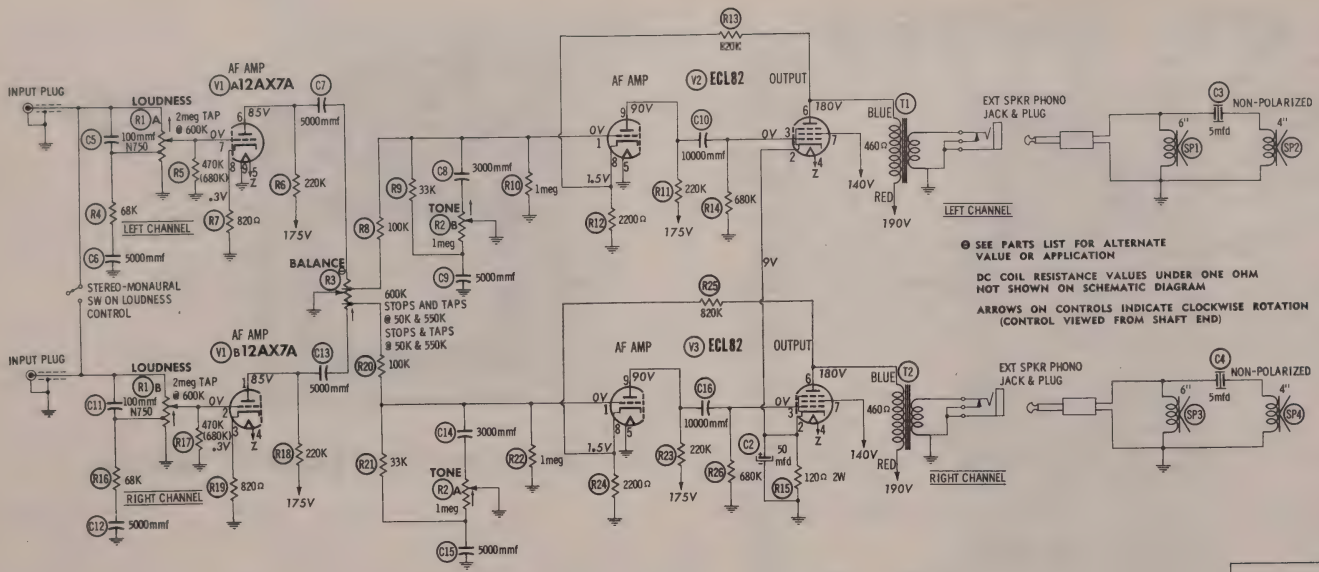
① Not used in some versions.

POWER CHASSIS—BOTTOM VIEW



AMP CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7A	†225K	0Ω	820Ω	.1Ω	.1Ω	†225K	0Ω	820Ω	0Ω
V2	ECL82 6BM8	220K	120Ω	680K	.1Ω	0Ω	†580Ω	†4800Ω	2200Ω	†225K
V3	ECL82 6BM8	220K	120Ω	680K	.1.	0Ω	†580Ω	†4800Ω	2200Ω	†225K
V4	EZ80 6V4	80Ω	NC	¶	INF	INF	NC	80Ω	NC	NC

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 3 OF V4. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MOTOROLA MODELS SH16B, E (Ch. HS-763, HS-792)

PHOTOFACT® Folder

**PACKARD-BELL
MODEL 4RC1**

PACKARD-BELL
MODEL 4RC1

PACKARD-BELL
MODEL 4RC1

TRADE NAME	Packard-Bell Model 4RC1
MANUFACTURER	Packard Bell Electronics Corp., Service Div., 1920 S. Figueroa Street, Los Angeles 7, California
TYPE SET	AC Operated 4 Tube AM Receiver With Electric Clock
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles
TUNING RANGE— BROADCAST	540 - 1620KC RATING 23 Watts, .2 Amp. @117 Volts AC (Less Clock)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Pre-set A4 fully clockwise.
Suggested alignment tools: A1, A2... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A3, A4... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 1 (grid) of Converter. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output.
2.	Loop	1620KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC	"	A4	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JG852

SET 496 FOLDER 13

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS •		GENERAL ELECTRIC •		RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE		ITEM No.	USE	TYPE
V1	Converter	12AU6		V3	Output	50EH5
V2	Det. -AF Amp.	12AV6		V4	Rectifier	50DC4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Packard-Bell PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	24178	PRS4400	BBRT5315C			TVAS-3445 *	
B	20	150							
C	5	25							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	68		DI-68	DD-680	L10Q68	CCD-680	GP468	10TS-Q68
C3	22000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2meg	½	25076					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	2, 2meg	
R3	3300Ω	

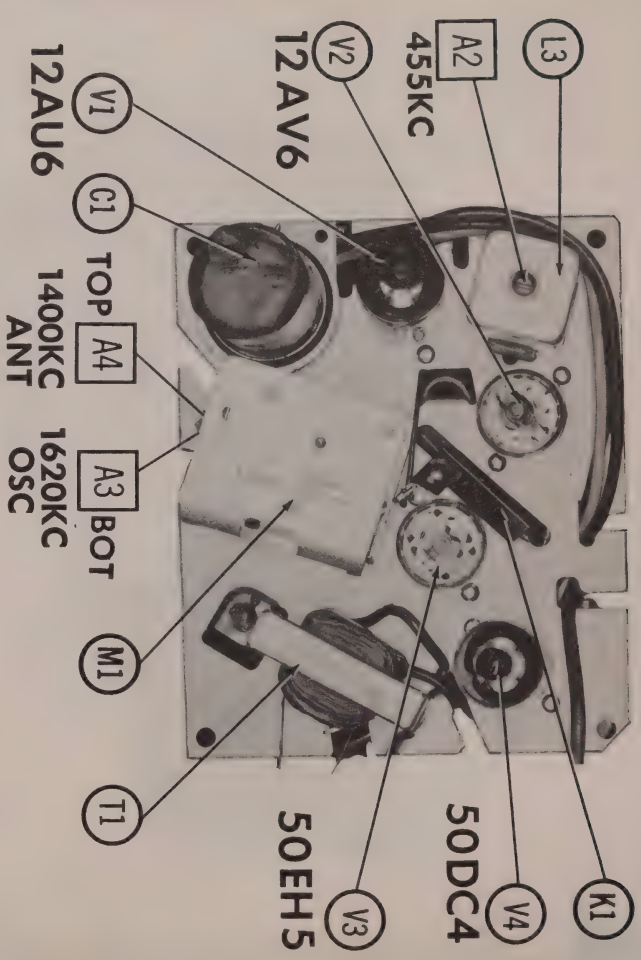
ITEM No.	RATING	REMARKS
R4	180Ω	
R5	3300Ω 1W	

ITEM No.	RATING	REMARKS
R6	22Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Packard - Bell PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Ant.	29177A						
L2	Osc. Coil	29248						
L3	IF Trans.	29175				12-C12		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2700Ω	3-4Ω	89487A	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	
SP1	3½"	PM	3-4Ω	83127B	3A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Packard-Bell PART No.	REPLACEMENT DATA	
K1	Audio Coupling	220mmf, 250mmf, 5000mmf, 5000mmf, 470K, 470K, 6.8meg	23656	Aerovox Centralab Cornell-Dubilier Mallory Sprague	PA-113-2 PC-151 116TM2 MS-107 DT-2

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M1 M2	Tuning Cap Clock	23560 58079A	2 Gang; Ant. 26-376mmf, Osc. 9-115mmf (Intermatic 6131)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

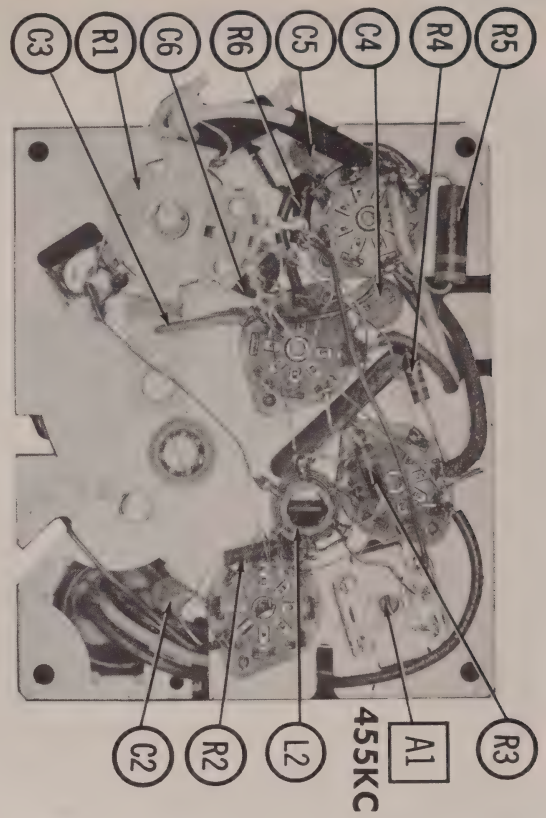
NAME	PART NO.	DESCRIPTION
Knob	52302A	Tuning
Knob	52271D	Tuning (Alternate)
Knob	52272C	Volume
Knob	52274B	Clock Control
Lens	55112B	Clock
Clock Hand	67051-1A	Hour
Clock Hand	67051-2A	Minute
Clock Hand	67052	Second
Clock Hand	67053B	Alarm Set

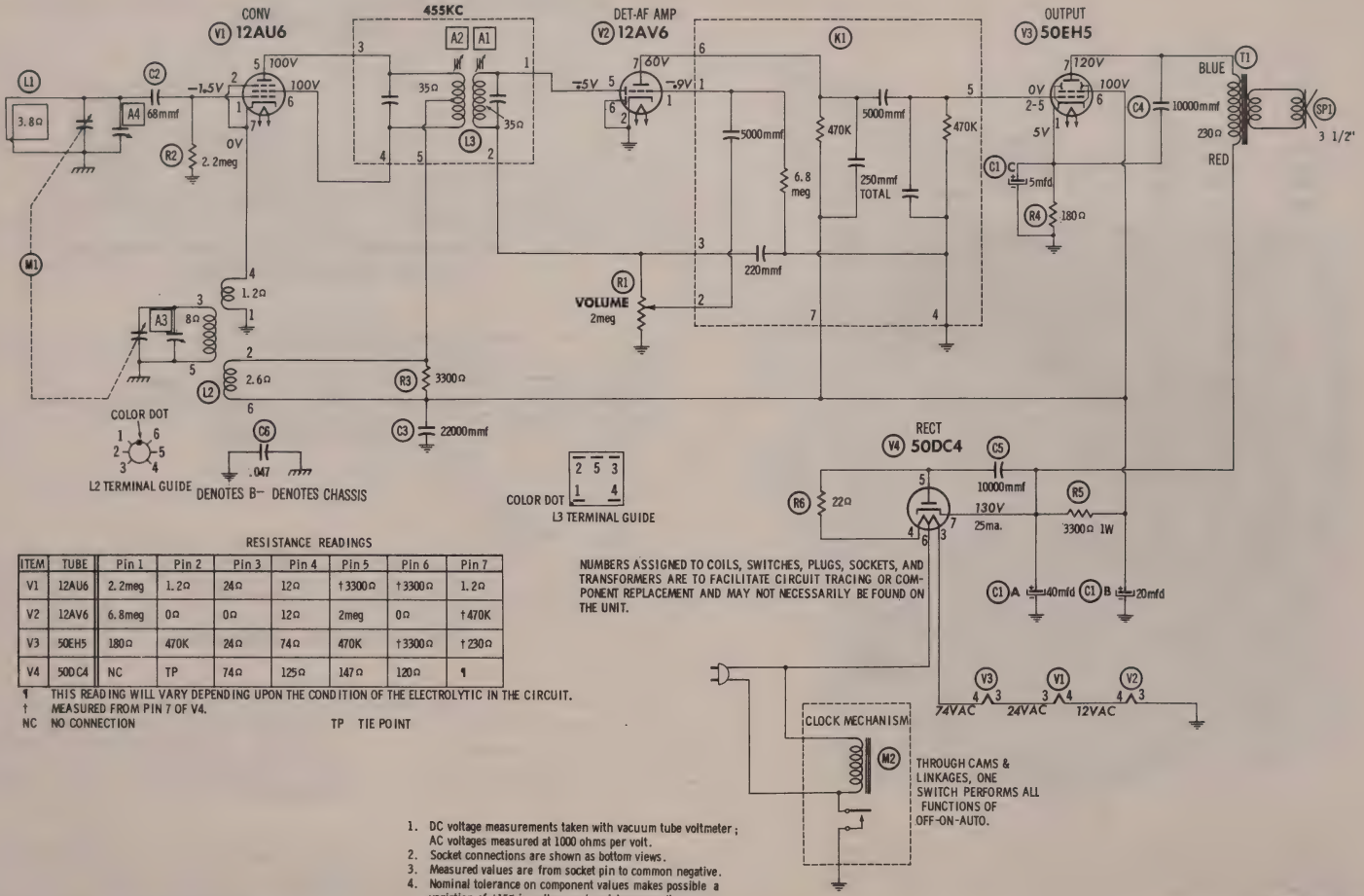
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12AU6	2.2meg	1.2Ω	24Ω	12Ω	†3300Ω	†3300Ω	1.2Ω
V2	12AV6	6.8meg	0Ω	0Ω	12Ω	2meg	0Ω	†470K
V3	50EH5	180Ω	470K	24Ω	74Ω	470K	†3300Ω	†230Ω
V4	50DC4	NC	TP	74Ω	125Ω	147Ω	120Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
NC NO CONNECTION TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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PACKARD-BELL MODEL 4RC1

PHOTOFACT® Folder with CIRCUITRACE®

RCA VICTOR MODELS BK2, DK109, DK111, KS4, TPM4, TPR8 (Ch. RC1193, A, RS177, B)

RCA VICTOR MODELS BK2, DK109, DK111, KS4, TPM4, TPR8 (Ch. RC1193, A, RS177, B)

MODEL TPR-8

RCA VICTOR MODELS BK2, DK109, DK111, KS4, TPM4, TPR8 (Ch. RC1193, A, RS177, B)

TRADE NAME	RCA Victor Models BK-2 (Tuner Ch. RC-1193A, Amp. Ch. RS-177B); DK-109, DK-111 (Speaker Unit); TPM-4, TPR-8 (Tuner Ch. RC-1193, Amp. Ch. RS-177); KS-4 (Speaker Unit)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated 13 Tube FM-AM Tuner and Stereo Preamplifier, 7 Tube Stereo Amplifier, and 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 215 Watts, 1.9 Amp. @117 Volts AC (Radio)
TUNING RANGE—BROADCAST	540 - 1600KC FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER RP-211-1 — SEE RCA VICTOR RP-211-1 — PHOTOFACT SET 475 FOLDER 7

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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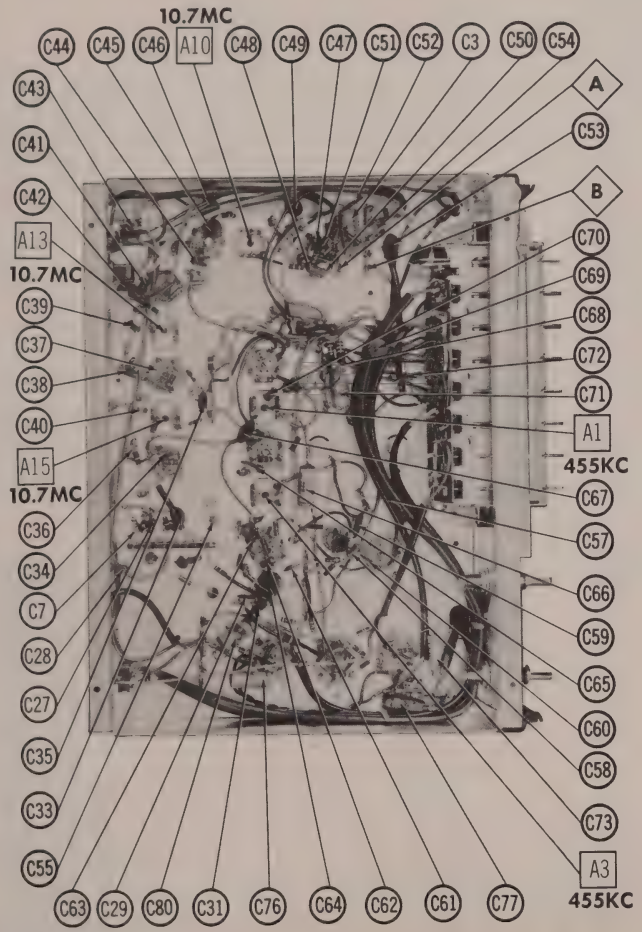
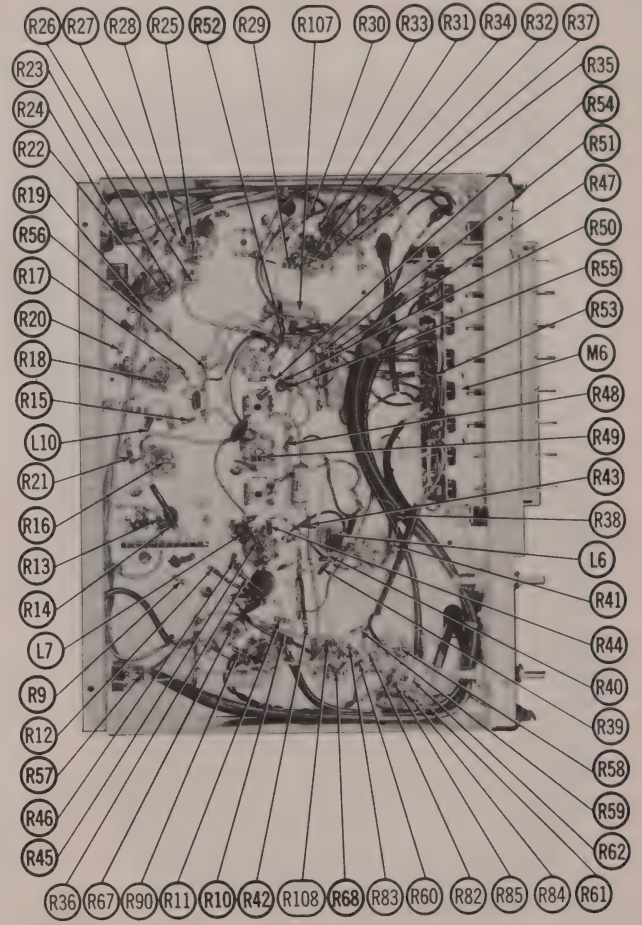
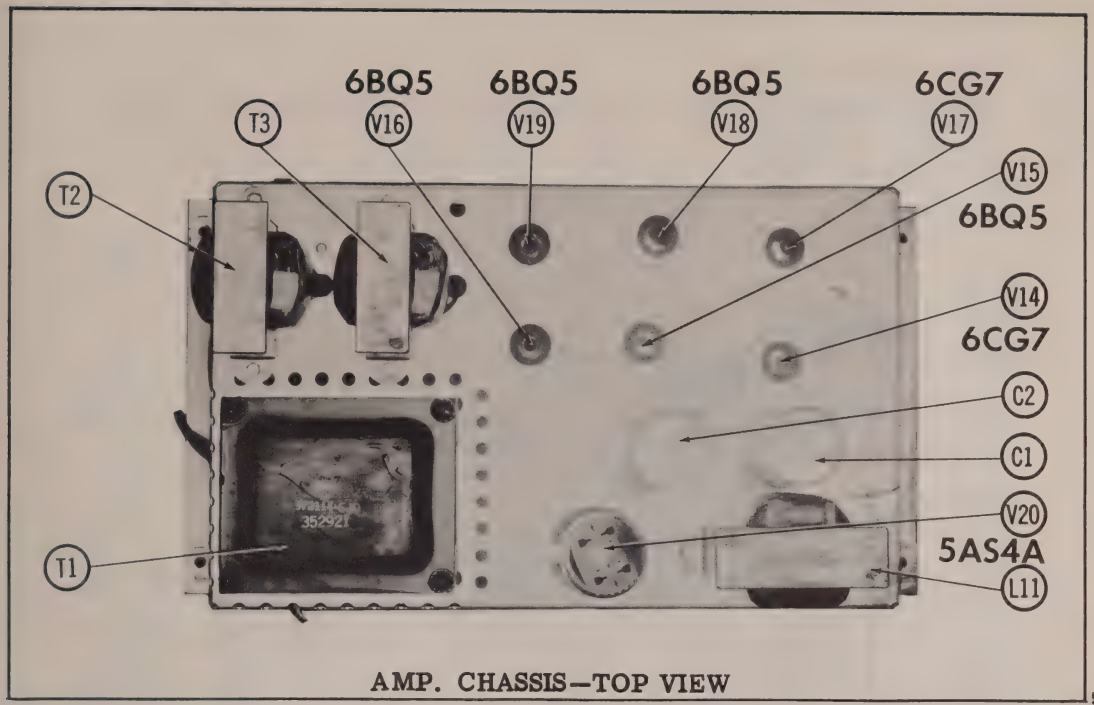


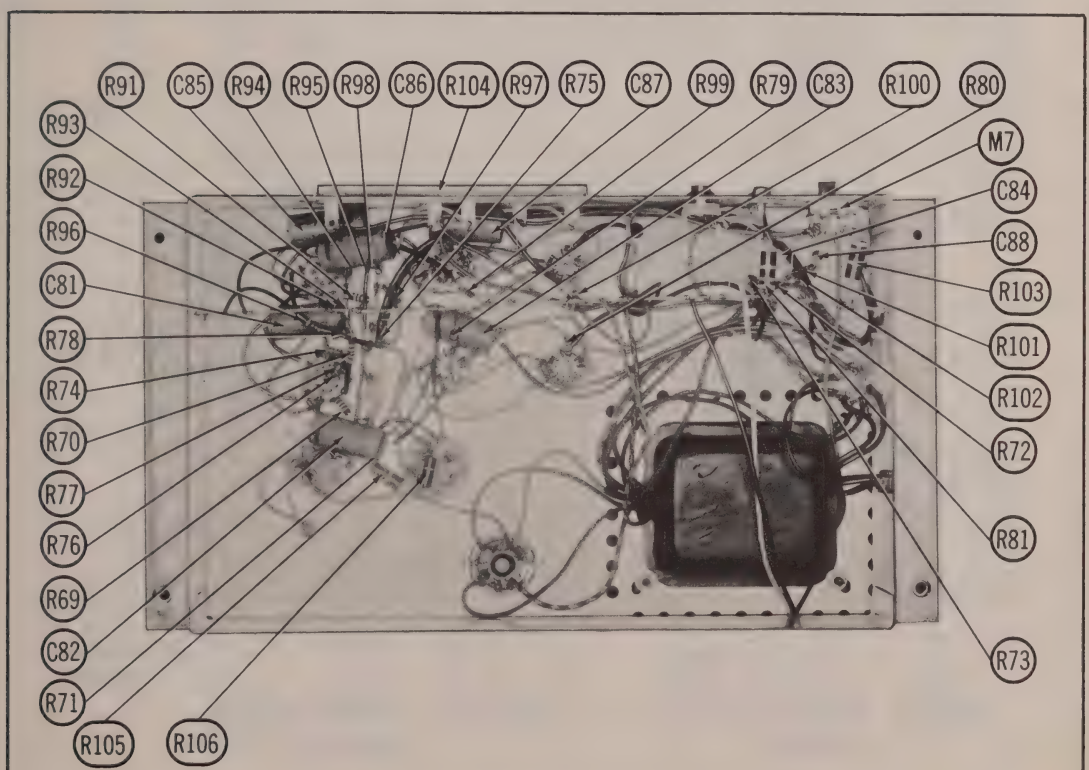
TUNER CHASSIS BOTTOM VIEW
ALIGNMENT & CAPACITOR IDENT.



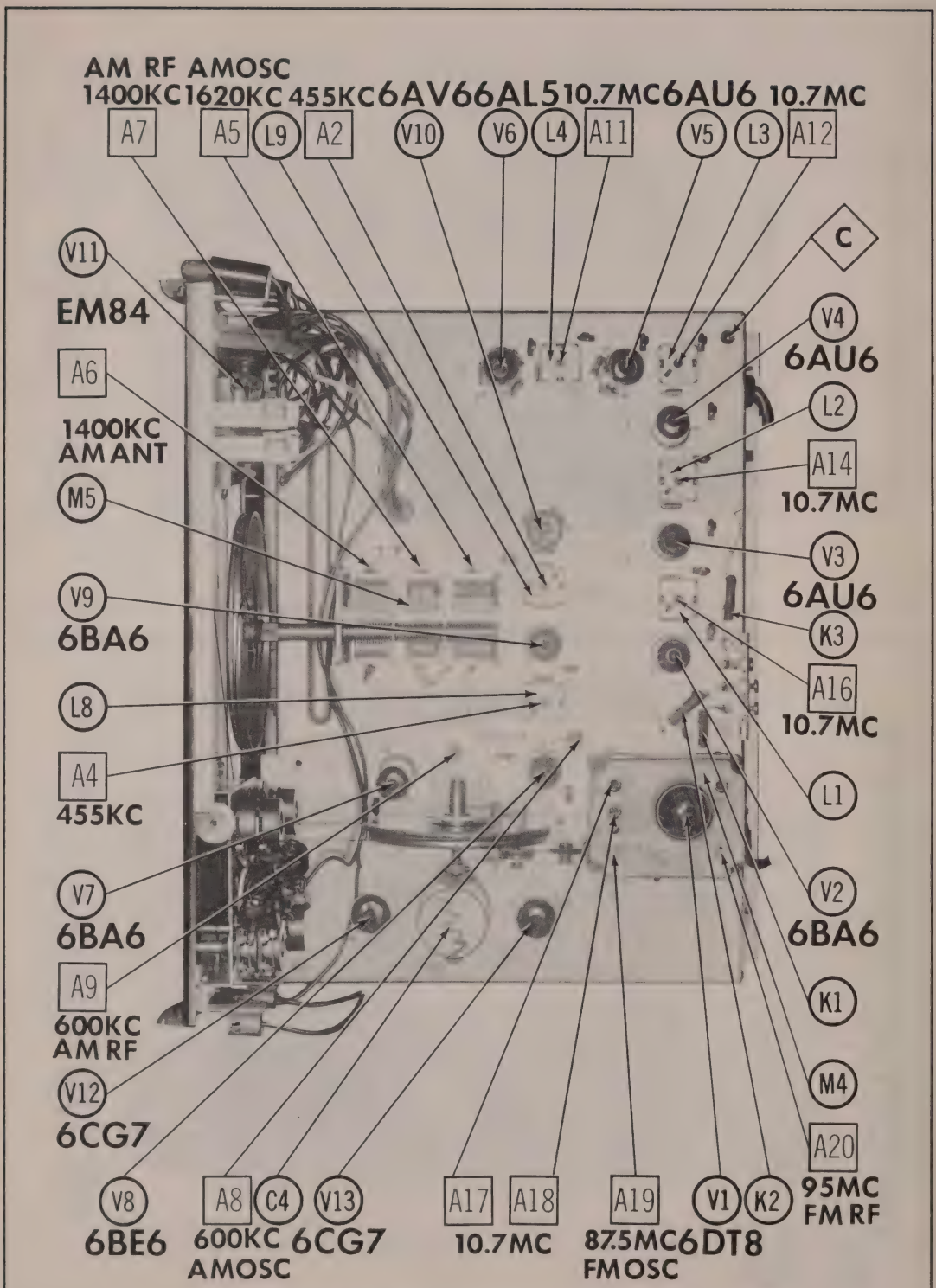
TUNER CHASSIS BOTTOM VIEW
RESISTOR & INDUCTOR IDENT.



AMP. CHASSIS—TOP VIEW



AMP. CHASSIS—BOTTOM VIEW



TUNER CHASSIS—TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested alignment tools:

A1 thru A4, A10 thru A16	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A6, A7	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A8, A9	GENERAL CEMENT #8721, 8722 WALSCO #2519
A17, A18	GENERAL CEMENT #8282, 8606, 8606-L, 9091 WALSCO #2526, 2541, 2542, 2543, 2544
A19, A20	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989 WALSCO #2515, 2531, 2532

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400~ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1620KC	"	"	A5	"
3.	"	1400KC	Tune to 1400KC signal.	"	A6, A7	"
4.	"	600KC	Tune to 600KC signal.	"	A8	Shunt A7 with 10K resistor. Adjust A8 for maximum output while rocking tuning gang. Disconnect resistor.
5.	"	"	"	"	A9	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

AFC "Off"

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru 4700mmf to pin 1 (grid) of FM Limiter. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A10	Adjust for maximum deflection.
7.	"	"	"	DC probe to point Ⓑ. Common to chassis	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	High side thru 4700mmf to pin 1 (grid) of 2nd FM IF. Low side to chassis.	"	"	DC probe to point Ⓒ. Common to chassis.	A12, A13	Adjust for maximum deflection. Shunt primary of L2 with 270Ω while making adjustments.
9.	"	"	"	"	A14	Shunt secondary of L2 with 270Ω and adjust A14 for maximum deflection.
10.	High side thru 4700mmf to pin 1 (grid) of 1st FM IF. Low side to chassis.	"	"	"	A15, A16	Shunt winding not being adjusted with a 270Ω. Adjust for maximum deflection.
11.	Across FM antenna terminals with 270Ω in each lead.	"	"	"	A17, A18	Adjust for maximum output.

ALIGNMENT INSTRUCTIONS (cont)

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

AFC "Off"
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	High side thru 4700mmf to pin 1 (grid) of FM Limiter. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. amp. to point (A). Low side to chassis.	A10	Disconnect Stabilizing Capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
7.	"	"	"	Vert. amp. to point (B). Low side to chassis.	A11	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A10 for maximum amplitude and straightness of crossover lines.
8.	High side thru 4700mmf to pin 1 (grid) of 2nd FM IF. Low side to chassis.	"	"	Vert. amp. to point (C). Low side to chassis.	A12, A13	Shunt primary of L2 with 270Ω while making adjustments. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
9.	"	"	"	"	A14	Shunt secondary of L2 with 270Ω and adjust A14 for maximum gain and symmetry of response similar to Fig. 1.
10.	High side thru 4700mmf to pin 1 (grid) of 1st FM IF. Low side to chassis.	"	"	"	A15, A16	Shunt winding not being adjusted with 270Ω. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
11.	Across FM antenna terminals with 270Ω in each lead.	"	"	"	A17, A18	Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

AFC "Off"
Adjustment of FM antenna transformer and neutralizing capacitor C11 should not be attempted.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	Across FM antenna terminals with 270Ω in each lead.	108.5MC (Unmod.)	(FM) High end stop.	DC probe to point (C). Common to chassis.	String Drive Collar.	Adjust for maximum deflection. (Make fine adjustment with adjustable pulley.
13.	"	87.5MC	Low end stop.	"	A19	Adjust for maximum deflection. Repeat Steps 12 and 13.
14.	"	95.0MC	95MC	"	A20	Adjust for maximum deflection while rocking tuning.

FIG. 1

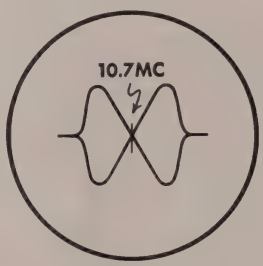
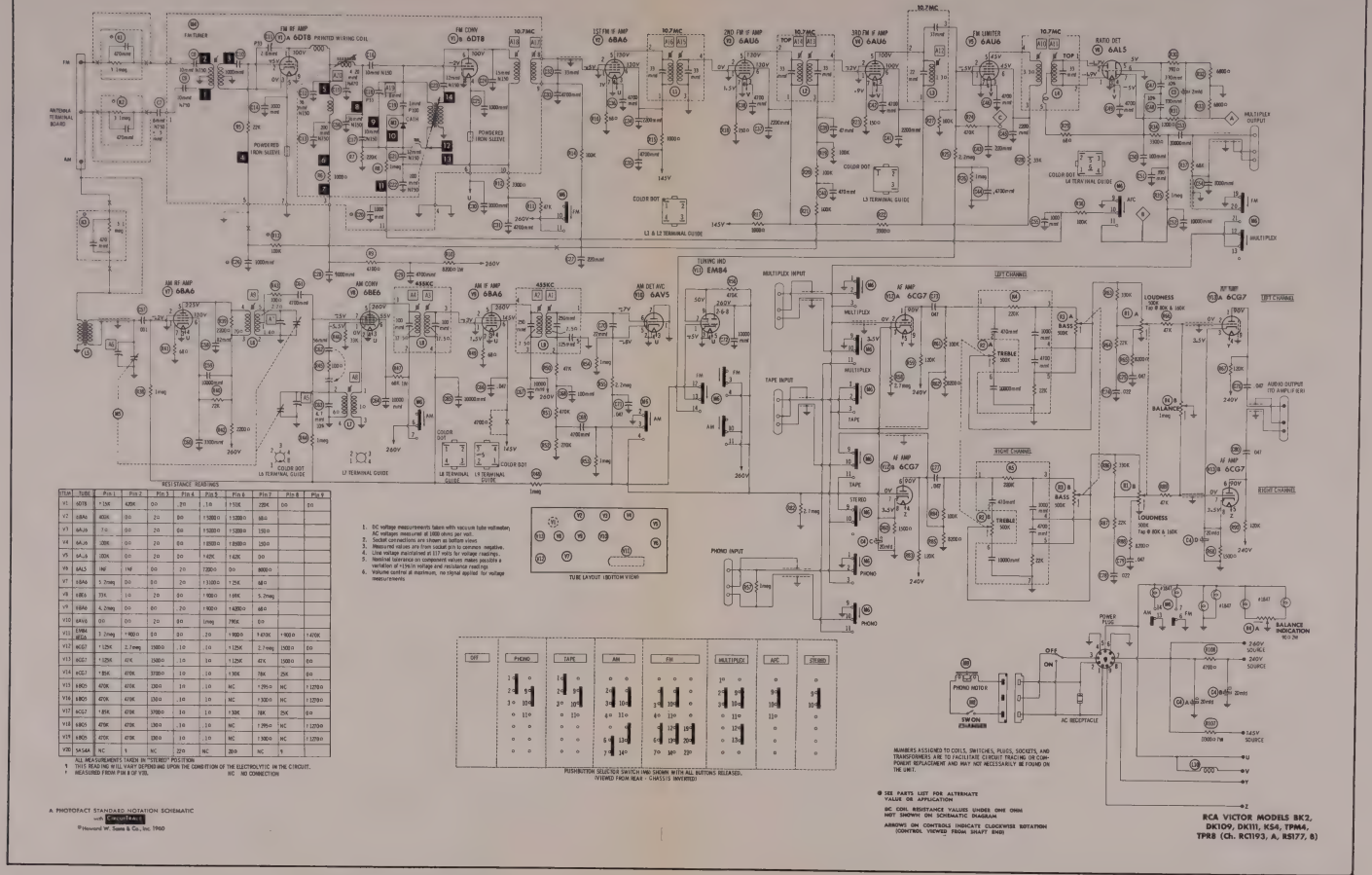


FIG. 2



RESISTANCE READINGS

TUBE	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DT8	*15K	420K	0Ω	2Ω	1Ω	*15K	22K	0Ω	0Ω
V2	6BA6	400K	0Ω	2Ω	0Ω	*500Ω	*500Ω	68Ω		
V3	6AJ8	1Ω	0Ω	2Ω	0Ω	*500Ω	*500Ω	150Ω		
V4	6AJ8	200K	0Ω	2Ω	0Ω	*850Ω	*850Ω	150Ω		
V5	6AJ8	200K	0Ω	2Ω	0Ω	*42K	*42K	0Ω		
V9	6AL5	INF	INF	0Ω	2Ω	720Ω	0Ω	800Ω		
V7	6BA6	5.2meg	0Ω	0Ω	2Ω	*300Ω	*25K	68Ω		
V8	6BE6	33K	1Ω	2Ω	0Ω	*90Ω	*69K	5.2meg		
V9	6BA6	4.2meg	0Ω	0Ω	2Ω	*90Ω	*420Ω	68Ω		
V10	6AV5	0Ω	0Ω	2Ω	0Ω	1meg	390K	0Ω		
V11	EM84 MEGA	3.2meg	*90Ω	0Ω	0Ω	2Ω	*90Ω	*470K	*90Ω	*470K
V12	6CG7	*125K	2.7meg	150Ω	0Ω	1Ω	*125K	2.7meg	150Ω	0Ω
V13	6CG7	*125K	47K	150Ω	0Ω	1Ω	*125K	47K	150Ω	0Ω
V14	6CL7	*85K	470K	470K	330Ω	1Ω	1Ω	*30K	78K	25K	0Ω
V15	6BD5	470K	470K	470K	120Ω	1Ω	1Ω	NC	*390Ω	NC	*1270Ω
V16	6BD5	470K	470K	470K	120Ω	1Ω	1Ω	NC	*300Ω	NC	*1250Ω
V17	6CL7	*85K	470K	470K	370Ω	0Ω	1Ω	*30K	78K	25K	0Ω
V18	6BD5	470K	470K	470K	120Ω	1Ω	1Ω	NC	*395Ω	NC	*1270Ω
V19	6BD5	470K	470K	470K	120Ω	1Ω	1Ω	NC	*300Ω	NC	*1270Ω
V20	5AS4A	NC	1	NC	220	NC	220	NC	1	

ALL MEASUREMENTS TAKEN IN "STEREO" POSITION
* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V20. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±1% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

MC CERA. RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUIT TRACE

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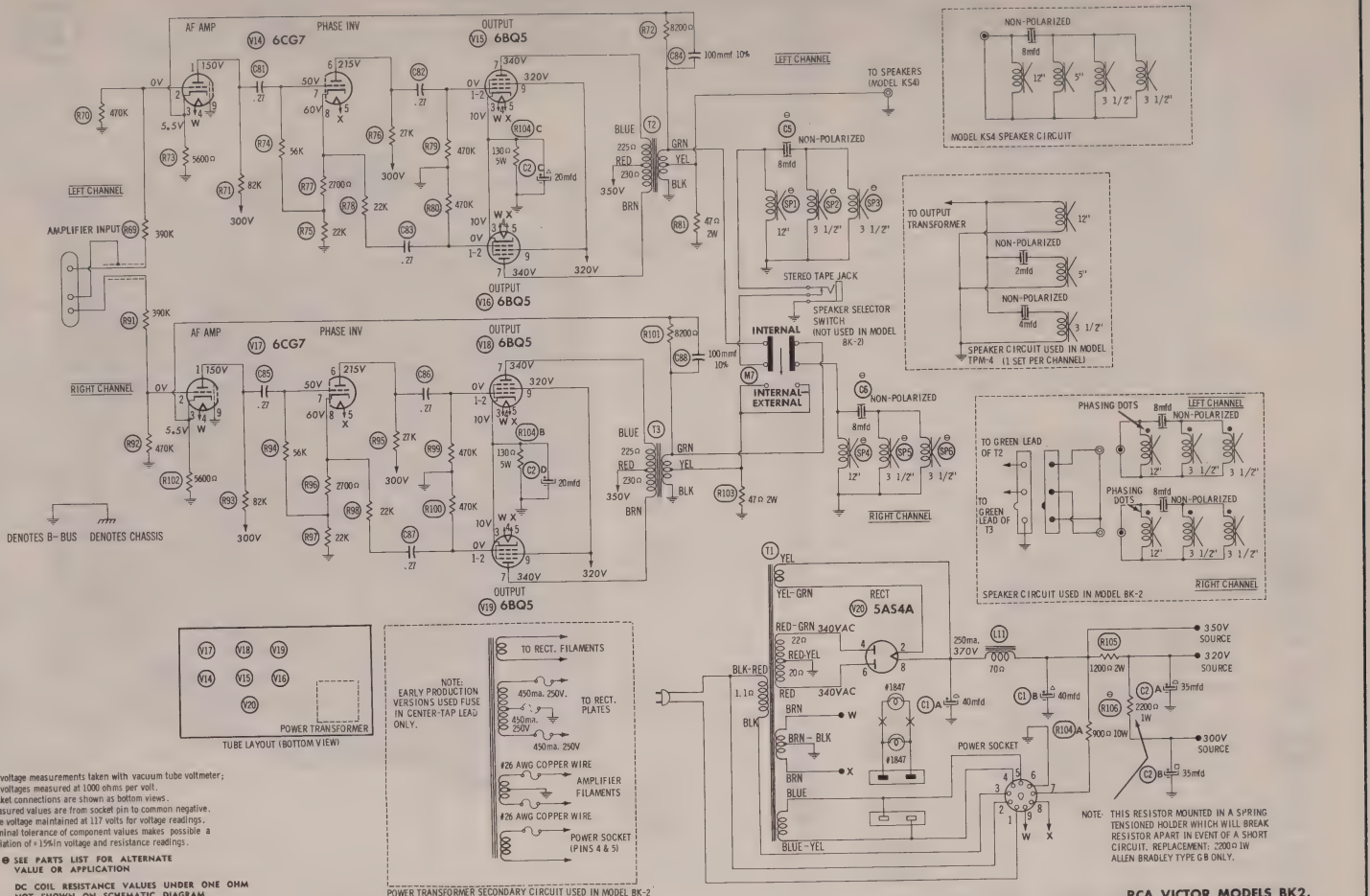
RCA VICTOR MODELS 8K2, DK109, DK111, KS4, TPM4, TPR8 (Ch. RC1193, A, RS177, B)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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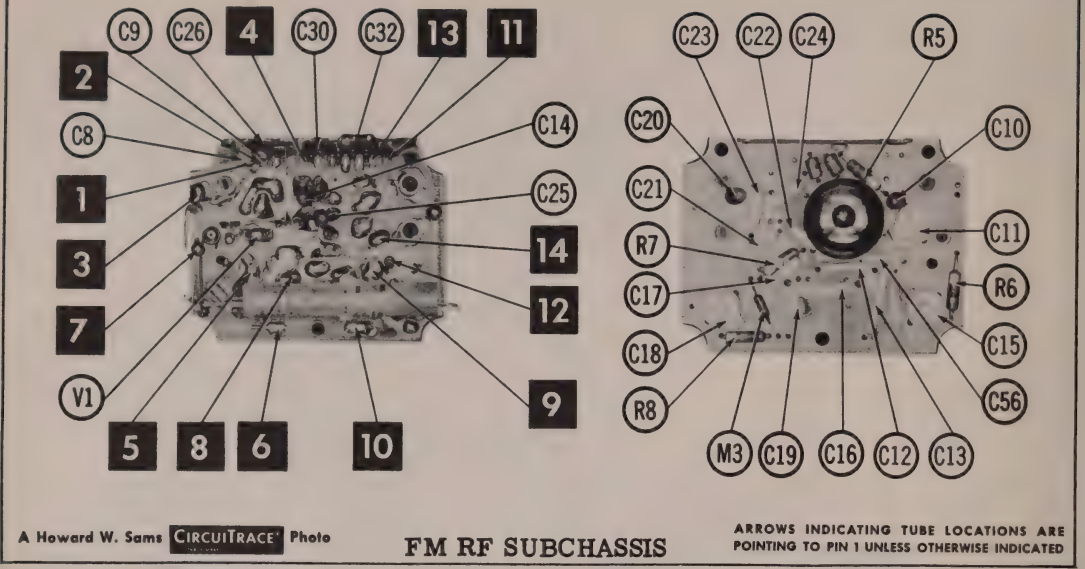
RCA VICTOR MODELS BK2, DK109, DK111, KS4, TPM4, TPR8 (Ch. RC1193, A, RS177, B)

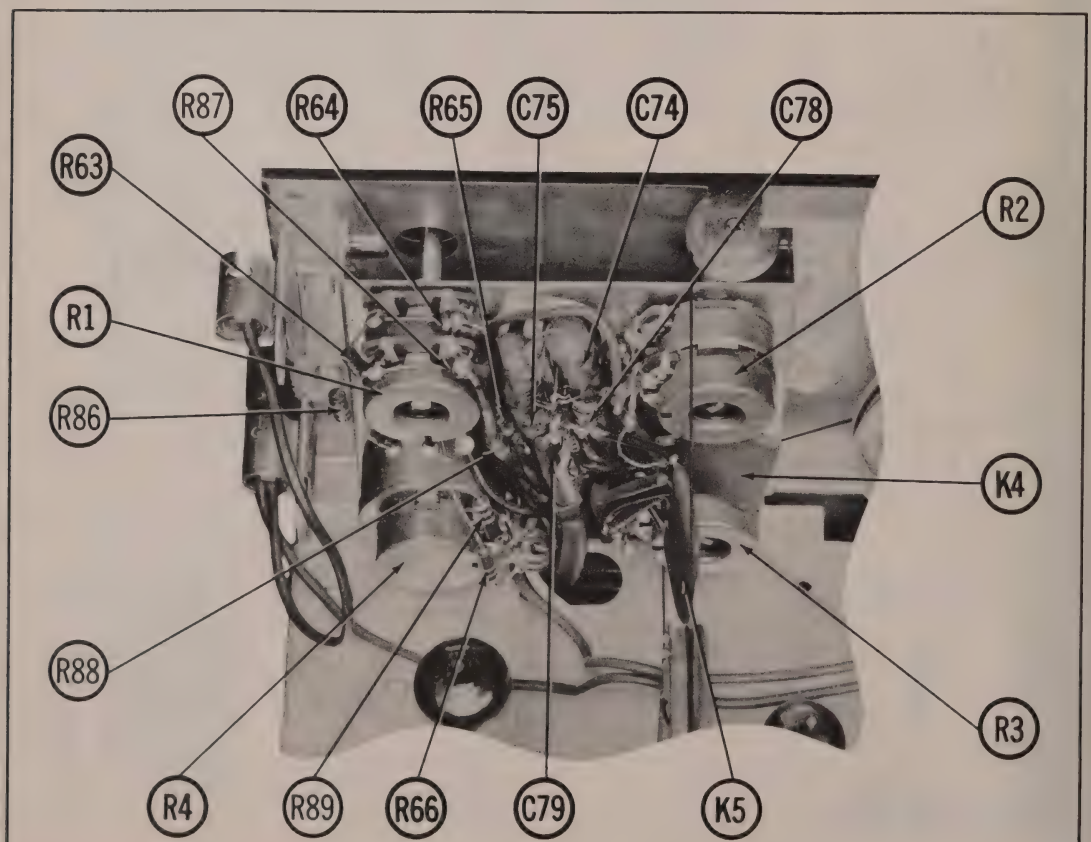
RCA VICTOR
MODEL BK2



A Howard W. Sams CIRCUITRACE® Photo

FM RF SUBCHASSIS

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



CONTROL PANEL—REAR VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	6DT8	V13	Left Channel AF Amp. - Right Channel AF Amp.	6CG7
V2	1st FM IF Amplifier	6BA6	V14	Left Channel AF Amp. - Phase Inverter	6CG7
V3	2nd FM IF Amplifier	6AU6	V15	Left Channel Output	6BQ5
V4	3rd FM IF Amplifier	6AU6	V16	Left Channel Output	6BQ5
V5	FM Limiter	6AU8	V17	Right Channel AF Amp. - Phase Inverter	6CG7
V6	Ratio Detector	6AL5	V18	Right Channel Output	6BQ5
V7	AM RF Amplifier	6BA6	V19	Right Channel Output	6BQ5
V8	AM Converter	6BE6	V20	Rectifier	5AS4A
V9	AM IF Amplifier	6BA6			
V10	AM Det. -AVC	6AV6			
V11	Tuning Indicator	EM84/6FG6			
V12	Left Channel AF Amp. - Right Channel AF Amp.	6CG7			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	102913	AFH2-57	B0450	FP238	TMD-54	TVL-2764	
B	▲40	450							
C2A	■35	400	108423	AFH4-79	D0663	FP447		TVL-4737	
B	■35	400							
C	▲20	25							
D	20	25							
C3	2	50	79181	PRS1300	BBR2-50	TC302	TD-2-50	TVA-1301	
C4A	▲20	400	106210	AFH4-57	D0520	FP430, 97	TMQ-73	TVL-4667	
B	■20	400							
C	▲20	25							
D	20	25							
C5	8	10NP	100509	PRS6200	BBR8-150	TCN108		TVANS-1112*	Note 1
C6	8	10NP	100509	PRS6200	BBR8-150	TCN108		TVANS-1112*	Note 1

Note 1. Model TPM4 uses 2 mfd (Part #106556) and 4 mfd (Part #106353) for each channel.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	6 N750 ±.5mmf	#77364			C10V6U			
C8	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C9	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	2-8 P33					*		10TCP-Q39
C12	36 N150					*		10TCP-Q39
C13	200 N750		N750-SI 200		C10T1U	CCTN-201	CN7-320	10TCU-T10
C14	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C15	4-20 N470							
C16	10 N150					*		10TCP-Q10
C17	10 N150					*		10TCP-Q10
C18	3-8 P33							
C19	1 P100							
C20	1000	Note 1	BPD-001	DD-102	BYA10S1	CCD-102	B-210	5HK-D10
C21	12 N150					*		10TCP-Q12
C22	100 N750		N750-SI 100	TCN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C23	12 N150					*		10TCP-Q12
C24	15 N150					*		10TCP-Q15
C25	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C26	1000	Note 2	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C27	220		SI 220	D6-221	L10T22	CCD-221	B-322	10TS-T22
C28	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C29	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C30	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C31	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-472	5HK-D47
C32	33		SI 33	D6-330	L10Q33	CCD-330	GP433	10TS-Q33
C33	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C34	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C35	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C36	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C37	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C38	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C39	47		SI 47	D6-470	L10Q47	CCD-470	GP447	10TS-Q47
C40	470		SI 470	D6-471	L10T47	CCD-471	B-347	10TS-T47
C41	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C42	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C43	220		SI 220	D6-221	L10T22	CCD-221	B-322	10TS-T22
C44	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C45	2200		BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C46	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C47	330 10%		1469-00033	DD-331	5R5T33	CM-19B-331K	MCB241	MS-333
C48	330 10%		1469-00033	DD-331	5R5T33	CM-19B-331K	MCB241	MS-333
C49	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C50	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C51	330		SI 330	D6-331	L10T33	CCD-331	B-333	10TS-T33
C52	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C53	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C54	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C55	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C56	36 N150					*		10TCP-Q39
C57	.001 200V		P288N-001	D6-102	CUB6D1	6DP-1-102	GEM-421	6TM-D1
C58	82		SI 82	D6-820	L10Q82	CCD-820	GP482	10TS-Q82
C59	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C60	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C61	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C62	56		SI 56	D6-560	L10Q56	CCD-560	GP456	10TS-Q56
C63	4.7 10%		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C64	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C65	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C66	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C67	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	100		SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C69	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C70	22		SI 22	D6-220	L10Q22	CCD-220	GP422	10TS-Q22
C71	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C72	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C73	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C74	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C75	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C76	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C77	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C78	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C79	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C80	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C81	.27 400V		P488N-27		CUB4P25	4DP-5-274	GEM-4025	4TM-P25
C82	.27 400V		P488N-27		CUB4P25	4DP-5-274	GEM-4025	4TM-P25
C83	.27 400V		P488N-27		CUB4P25	4DP-5-274	GEM-4025	4TM-P25
C84	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10
C85	.27 400V		P488N-27		CUB4P25	4DP-5-274	GEM-4025	4TM-P25
C86	.27 400V		P488N-27		CUB4P25	4DP-5-274	GEM-4025	4TM-P25
C87	.27 400V		P488N-27		CUB4P25	4DP-5-274	GEM-4025	4TM-P25
C88	100 10%		NPO-SI 100	D6-101	L10T1	CCD-101	GP310	10TS-T10

Note 1. Not used in Chassis RC-1193A.
Note 2. Not used in Chassis RC-1193A and late vers-ons of RC-1193.
\# RCA Victor Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K *		108433	BT-159				Loudness, Left Channel
B	500K *			STR-159				Loudness, Right Channel
R2A	500K		108432	B-617	AD47-500K-Z		FB55A	Treble, Left Channel
B	500K			SR-617	Not Req.		RU55A	Treble, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R3A	500K		108431	B-60	AD47-500K-Z		FB55A	Bass, Left Channel
B	500K			SR-60	Not Req.		RU55A	Bass, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
R4A	90Ω	2(WW)	108434					Balance Indicator
B	1meg							Balance

* Taps @ 80K & 160K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	22K	
R6	1000Ω	
R7	220K	
R8	1meg	
R9	4700Ω	
R10	8200Ω 1W	
R11	47K	
R12	3300Ω	
R13	100K	Note 1
R14	100K	
R15	1000Ω	
R16	68Ω	
R17	1000Ω	
R18	150Ω	
R19	100K	
R20	100K	
R21	100K	
R22	3300Ω	
R23	150Ω	
R24	470K	
R25	2.2meg	
R26	1meg	
R27	100K	
R28	33K	
R29	68Ω	
R30	390Ω	
R31	1200Ω	
R32	6800Ω	
R33	6800Ω	
R34	3300Ω	
R35	1meg	
R36	100K	
R37	68K	
R38	1meg	
R39	2200Ω	
R40	22K	
R41	68Ω	
R42	2200Ω	
R43	100Ω	
R44	1meg	
R45	100Ω	
R46	33K	
R47	68K 1W	
R48	1meg	
R49	68Ω	
R50	47K	
R51	470K	
R52	270K	
R53	1meg	
R54	1meg	
R55	2.2meg	
R56	470K	
R57	1meg	
R58	2.7 meg	
R59	120K	
R60	1500Ω	
R61	100K	
R62	8200Ω	
R63	330K	
R64	22K	
R65	8200Ω	
R66	47K	
R67	120K	
R68	1500Ω	
R69	390K	
R70	470K	
R71	82K	
R72	8200Ω	
R73	5600Ω	
R74	56K	
R75	22K	
R76	27K	
R77	2700Ω	
R78	22K	
R79	470K	
R80	470K	
R81	47Ω 2W	
R82	2.7meg	
R83	120K	
R84	100K	
R85	8200Ω	

RESISTORS (cont)

ITEM No.	RATING	REMARKS
R86	330K	
R87	22K	
R88	8200Ω	
R89	47K	
R90	120K	
R91	390K	
R92	470K	
R93	82K	
R94	56K	
R95	27K	
R96	2700Ω	
R97	22K	
R98	22K	
R99	470K	
R100	470K	
R101	8200Ω	
R102	5600Ω	
R103	47Ω 2W	
R104A	900Ω 10W	
B	130Ω 5W	#108422
C	130Ω 5W	
R105	1200Ω 2W	
R106	2200Ω 1W	Note 2
R107	3300Ω 7W	#102417
R108	4700Ω	

Note 1. Not used in Chassis RC-1193A and late versions of RC-1193.
Note 2. Allen-Bradley type GB used as circuit breaker in Chassis RS-177B. See diagram for installation details.
\# RCA Victor Part Number.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA	
K1	FM Antenna Filter	470mmf, .3-1meg	104328 *	Centralab	RC-471
K2	FM Antenna Filter	470mmf, .3-1meg	104328 *	Sprague	AC1-1
K3	AM Antenna Filter	470mmf, .3-1meg	104328 *		
K4	Tone Comp.	470mmf, 1000mmf, 4700mmf, 10000mmf, 22K, 220K	106457		
K5	Tone Comp.	470mmf, 1000mmf, 4700mmf, 10000mmf, 22K, 220K	106457		

* Not used in Tuner Chassis RC-1193A and late versions of Tuner Chassis RC-1193.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RCA Victor PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	2nd FM IF Trans.	108582	16-3487	16-3487	FM-254	1463		
L2	3rd FM IF Trans.	108582	16-3487	16-3487	FM-254	1463		
L3	4th FM IF Trans.	77512						
L4	Ratio Det.	108583	17-3498	17-3498	FM-255	1465		
L5	Loopstick	108440	14-7002	14-7002	BC-418	705-A		
L6	AM RF Coil	77525	14-1076	14-1076				
L7	AM Osc. Coil	73048			BC-393	71-OSC*		
L8	1st AM IF Trans.	77416	16-6758	16-6758	BC-352	12-C1	RF-1	
L9	2nd AM IF Trans.	76328	16-6770	16-6770	BC-355	12-C6		
L10	Fil. Choke	71942	19-1000	19-1000	BC-561	4602		1uh

* Drill new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L11	.250A	70Ω	4.3HY	108424				C-2334		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.9A	680 VCT @ .250A	5V @ 3A	108419						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VCT @ 5.5A	6.3V @ 3.8A								

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	6600Ω CT	8ΩTap @ 4Ω	108421		A-3028					
T3	6600Ω CT	8ΩTap @ 4Ω	108421		A-3028					

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	100897 *	12A10PA	* Model TPR-8
SP2	3½"	PM	6-8Ω	105395 *	3A15TZ4.9	(Refer to schematic for speakers used in other models)
SP3	3½"	PM	6-8Ω	105395 *	3A15TZ4.9	
SP4	12"	PM	6-8Ω	100897 *	12A10PA	
SP5	3½"	PM	6-8Ω	105395 *	3A15TZ4.9	
SP6	3½"	PM	6-8Ω	105395 *	3A15TZ4.9	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	RCA Victor PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	10690A	13TB		26S	S1-1 S3-3			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS	
	RCA Victor PART No.	CLEVITE WALCO PART No.	JENSEN PART No.		
M2	108215 †♦	W-103STSS † or W-103STDS †♦	M-77X † or M-77XSD †♦ or M-77XDD ♦	† Jewel	♦ Diamond

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		RCA Victor PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3						FM AFC Diodes

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M4	Tuner	108444	FM Complete
M5	Tuning Cap.	108428	AM, 3 Gang (Ant. 57-417mmf, RF 20-246mmf, Osc. 17-148mmf)
M6	Switch	108425	Function, Pushbutton Type (Includes Off-On Switch Part #108519)
M7	Switch	46760	Speaker Selector, (DPDT Slide Type) Chassis RS-177 only
M8	Switch	108457	Changer Off-On, (Part of Changer)
M9	Motor		Phono Drive (Part of Changer)

CABINETS & CABINET PARTS

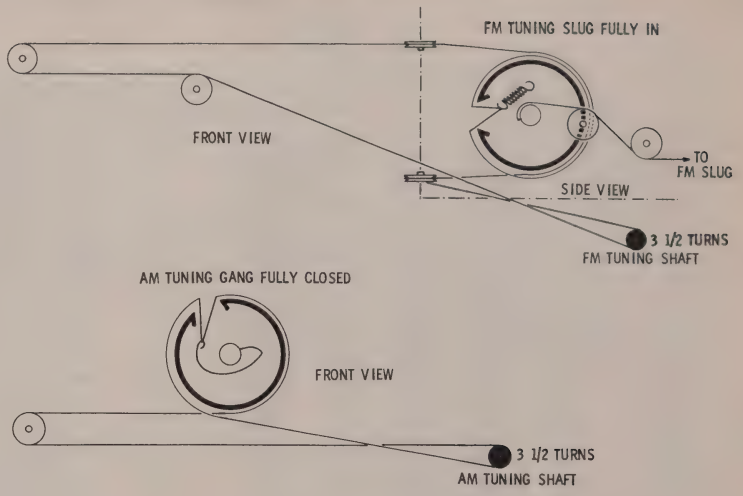
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	108501	FM, AM Tuning
Knob	108507	Loudness, Bass, Treble, Balance
Button	108502	Pushbutton for Function Switch, Models TPR-8, TPM-4
Button	108919	Pushbutton for Function Switch, Model BK-2
Pointer	108438	AM Station Indicator
Pointer	108437	FM Station Indicator
Lens	108429	"Stereo-Balance" Indicator
Dial	108503	Tuning

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)

DIAL CORD STRINGING



PHOTOFACT® Folder

RECORDIO
MODEL T-600

RECORDIO
MODEL T-600

RECORDIO
MODEL T-600

TRADE NAME	Recordio Model T-600
MANUFACTURER	Recordio Corp., Charlotte, Michigan
TYPE SET	Externally Powered AC Operated 2 Tube AM Tuner
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 20 Watts, .46 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1750KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.
Suggested alignment tools: A1 thru A4.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .01mfd to pin 7 (grid) of Converter. Low side to chassis.	456KC (400~ Mod.)	Tuning gang fully open.	AC probe across output jack.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

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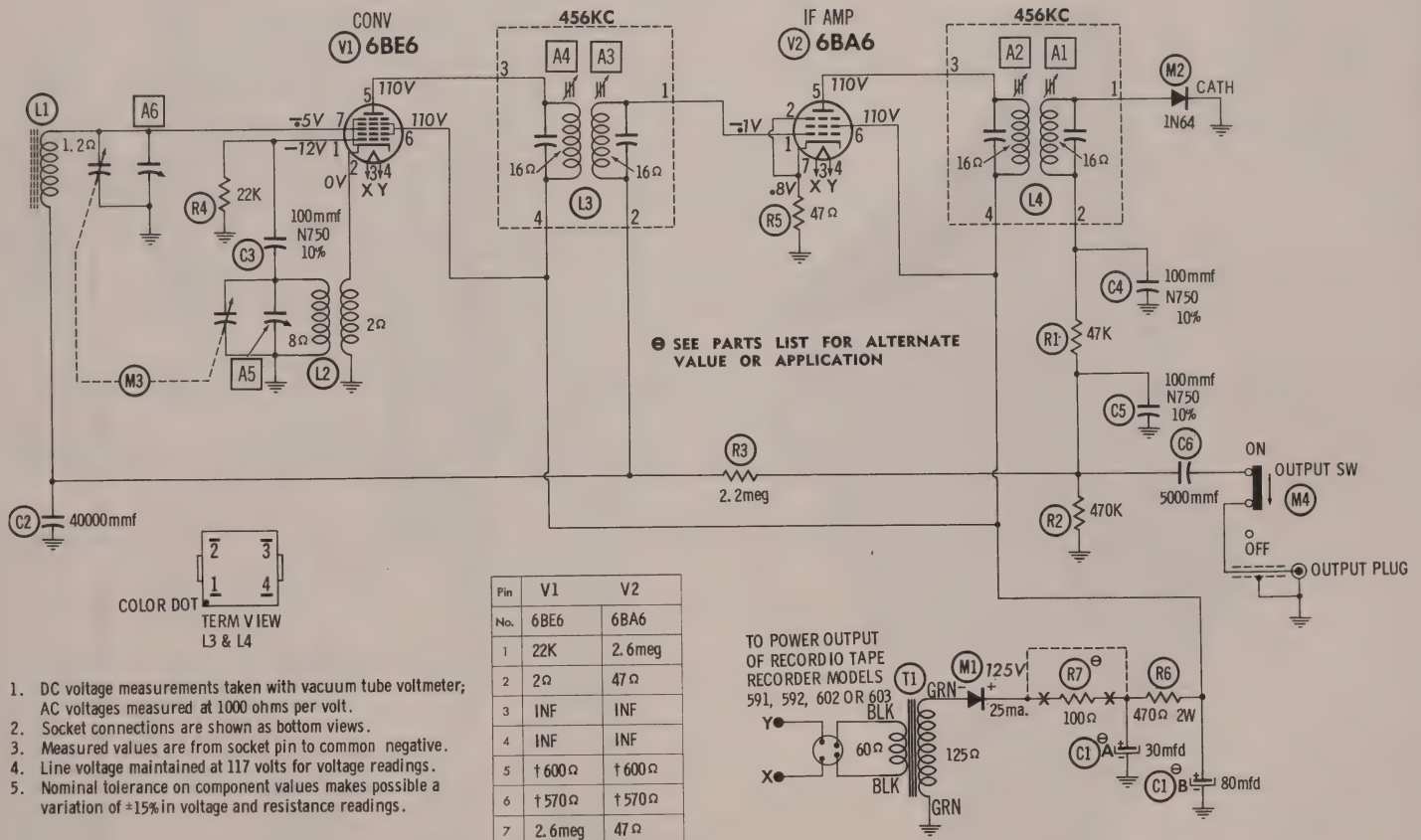
JH837

SET 496 FOLDER 15



Pin No.	V1 6BE6	V2 6BA6
1	22K	2.6meg
2	2Ω	47Ω
3	INF	INF
4	INF	INF
5	†600Ω	†600Ω
6	†570Ω	†570Ω
7	2.6meg	47Ω

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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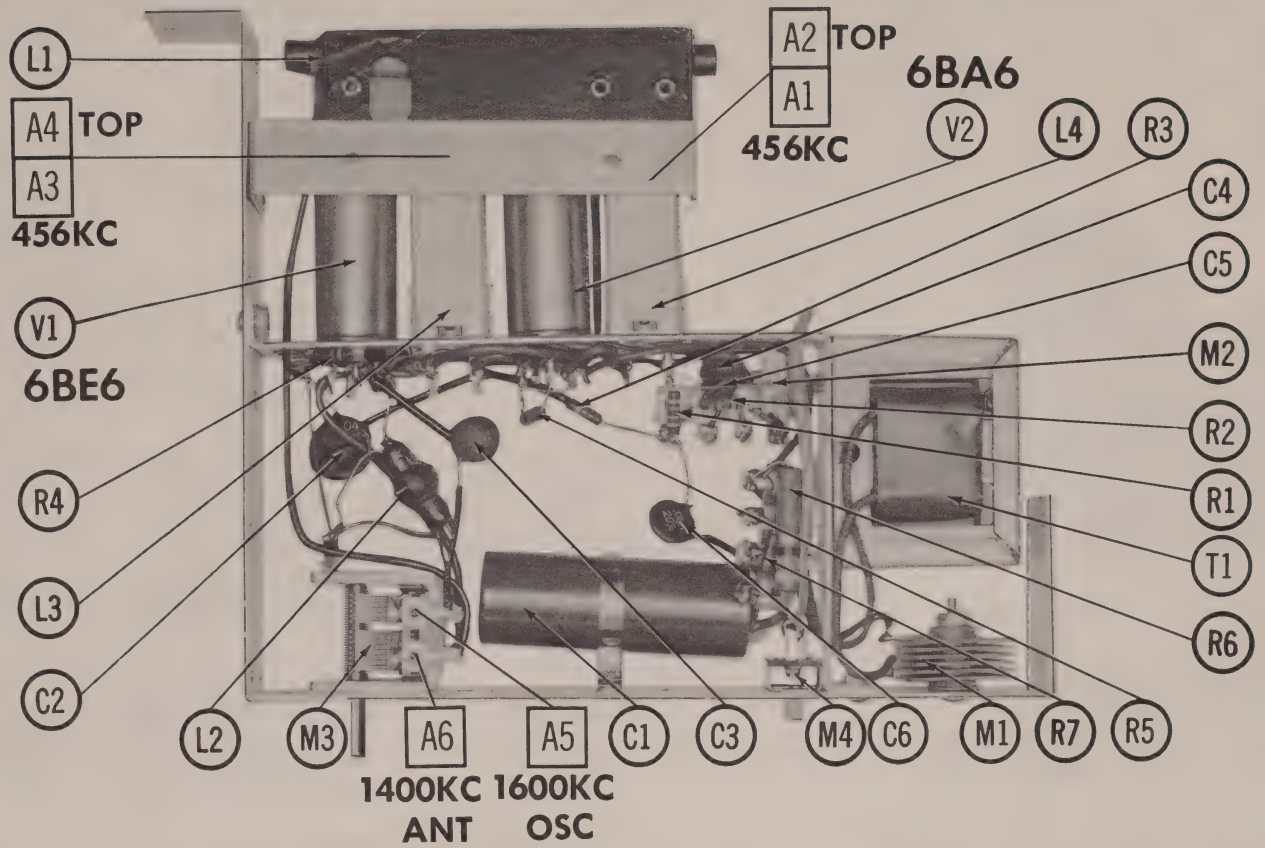


CHASSIS TOP VIEW

MODEL T-600

RECORDIO

FOLDER 15

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	6BE6	V2	IF Amplifier	6BA6

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RECORDIO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	30	150	5.415-7	PRS2230	BBRD8415	TCD4975	TDLD-10	TVA-2460	
B	80	150							
C	150	6	①						

① C1C is not used.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	40000			DD-403	BYB6S4	6DP-3-403	GP140	5HK-S40
C3	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C4	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C5	100 N750 10%		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C6	5000		BPD-005	DD-503	BYA10D5	CCD-502	B-250	5HK-D50

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	47K	
R2	470K	
R3	2.2meg	

ITEM No.	RATING	REMARKS
R4	22K	
R5	47Ω	
R6	470Ω 2W	

ITEM No.	RATING	REMARKS
R7	100Ω	Note 1

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		RECORDIO PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc. Coil					70-OSC		
L3	Input IF		16-6758	16-6758	BC-352	12-C1	RF-1	
L4	Output IF		16-6758	16-6758	BC-353	12-C2	RF-2	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	RECORDIO PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ⓐ .46A	112V ⓐ .025A		9.292						

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	RECORDIO PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.025A		RS075 *	1003A *	75 *	SR200 ◆	* Selenium ◆ Silicon

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		RECORDIO PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N64		1N60	1N60	1N64	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RECORDIO PART No.	NOTES
M3	Tuning Cap.		2 Gang, Ant. 7–184mmf, Osc. 7–90mmf
M4	Switch		Off-On, (SPDT Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

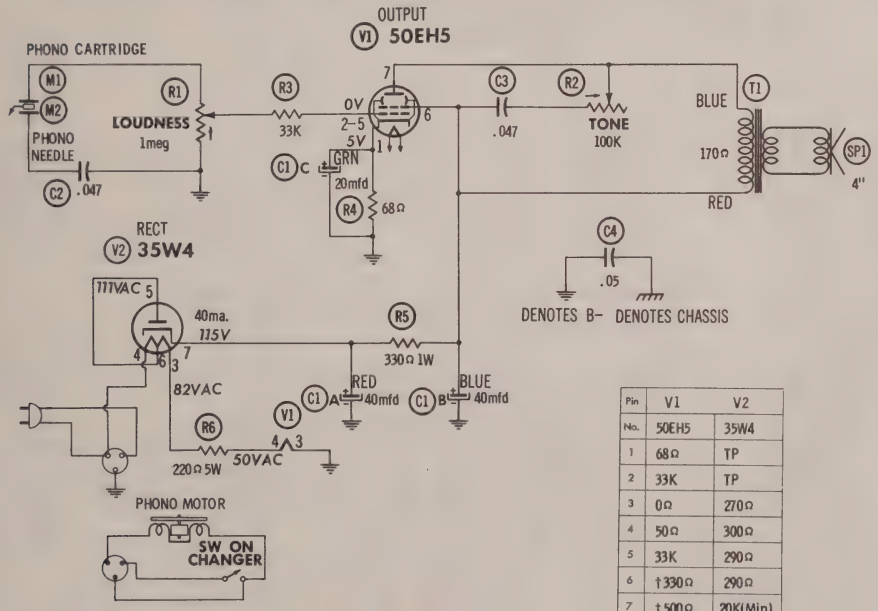
PHOTOFACT® Folder

ROLAND
MODEL 41-683

ROLAND
MODEL 41-683

TRADE NAME	Roland Model 41-683
MANUFACTURER	Roland Radio Corp., 716 S. Columbus Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated 2 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 23 Watts, .22 Amp. @117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #300402 — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11



Pin No.	V1 50EH5	V2 35W4
1	68Ω	TP
2	33K	TP
3	0Ω	270Ω
4	50Ω	300Ω
5	33K	290Ω
6	†330Ω	290Ω
7	†500Ω	20K(Min)

† MEASURED FROM PIN 7 OF V2.

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JS829

SET 496 FOLDER 16

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Output	50EH5	V2	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS3650	BBRT44215	WT217	CDB-Q-1001	TVA-3448	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	360080	B-70	A47-1meg-Z	Q13-137	U53	Loudness
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	100K	½	360050	B-41	A47-100K-Z	Q13-128	U39	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	33K	
R4	68Ω	

ITEM No.	RATING	REMARKS
R5	330Ω 1W	

ITEM No.	RATING	REMARKS
R6	220Ω 5W	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4000Ω	3-4Ω	430574	24S48	A-3025	AU-601	A-3877	24S48	S-3X	

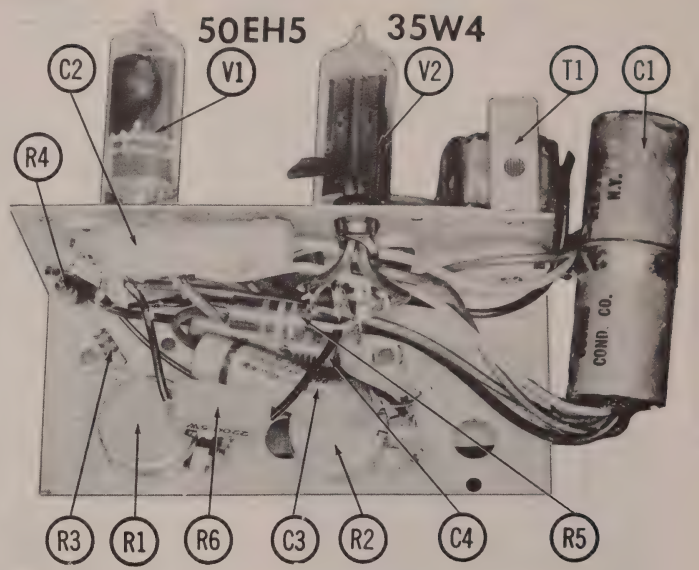
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	404001	4A1	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	ROLAND PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		420-TS-TH	N8-1 N8-3						

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ROLAND PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	(78 RPM)	W-64S † or W-64D ♦	CRA-55 † or CRA-55D ♦	† Jewel ♦ Diamond
	(LP)	W-64MGS † or W-64MGD ♦	CRA-55LP † or CRA-55LPD ♦	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	272242	Loudness
Knob	272243	Tone
Case	241190	Red & White
Case	241200	Black & White

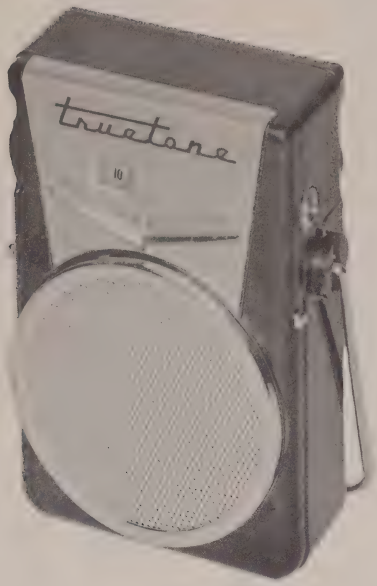
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder with CIRCUITRACE®

TRUETONE MODEL DC3090

TRUETONE
MODEL DC3090



TRUETONE
MODEL DC3090

TRADE NAME	Truetone Model DC3090
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Mo.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC RATING 11MA @ 9 Volts DC
TUNING RANGE-BROADCAST	535-1650KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2.....GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A3, A5.....GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	Loop	455KC (400∿ mod.)	Tuning gang fully open	Across voice coil	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2	"	1600KC	1600KC	"	A3	"
3	"	600KC	600KC	"	A4	Adjust for maximum output while rocking tuning gang.
4	"	1400KC	Tune to 1400KC signal	"	A5	"

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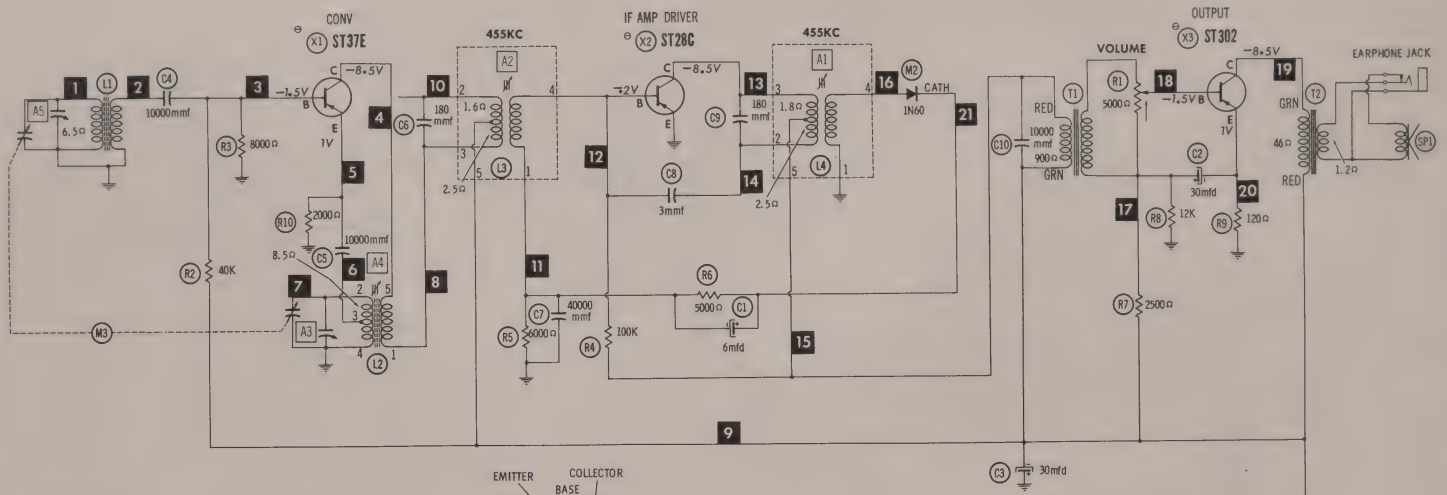
JF904

SET 496 FOLDER 17



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common positive.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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TRUETONE MODEL DC3090

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	ST-37E①	Converter		2N411	2N486	2N412	PNP
X2	ST-28C②	IF Amp - Driver		2N409	2N483	2N410	PNP
X3	ST-302③	Output		2N407	2N633	2N408	PNP

① Alternate types 2S30, 2N411, 2N412 may be used.
② Alternate types 2S31, 2N409, 2N410 may be used.
③ Alternate types 2S33, 2N407, 2N408 may be used.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	6	6			NLW231	TT6X5	ML6-6	TE-1085	
C2	30	10			NLW260	TT15X30		TE-1132	
C3	30	10			NLW260			TE-1132	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C5	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C6	180		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C7	40000							
C8	3		NPO-DI3. 0	DTZ-3R3	C10V3C	CCTO-3R3	CNO-3R3	10TCC-V33
C9	180		DI-180	DD-181	L10T18	CCD-181	GP318	10TS-T18
C10	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/10		B16-214				Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	40K	
R3	8000Ω	
R4	100K	

ITEM No.	RATING	REMARKS
R5	6000Ω	
R6	5000Ω	
R7	2500Ω	

ITEM No.	RATING	REMARKS
R8	12K	
R9	120Ω	
R10	2000Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		TRUETONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick							
L2	Osc Coil							
L3	1st IF Trans.							
L4	2nd IF Trans.							

PRINTED BOARD

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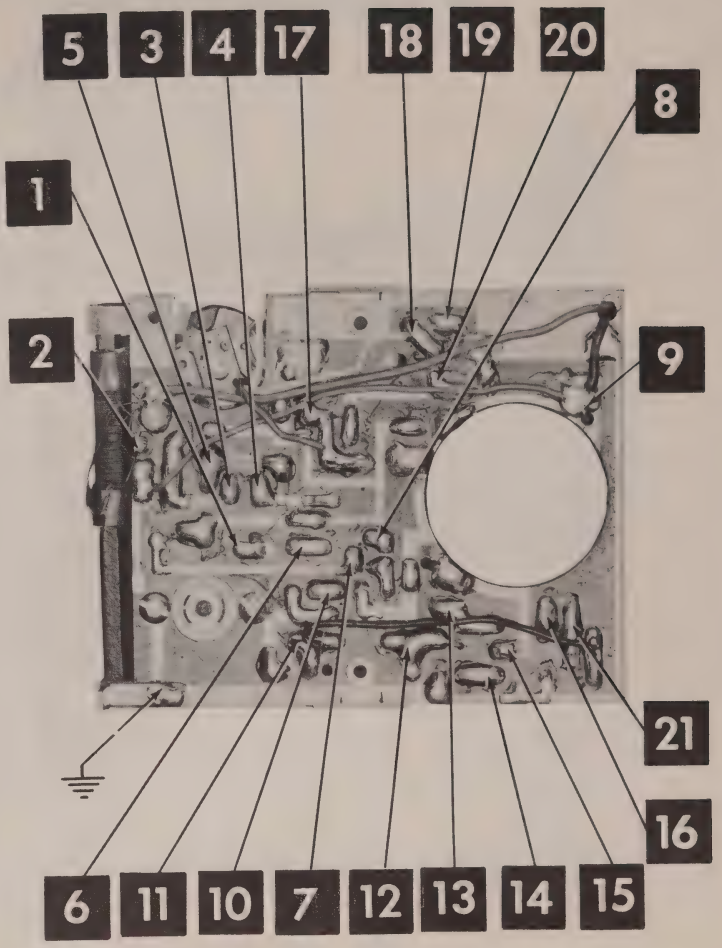


TRUETONE
MODEL DC3090

FOLDER 17

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3.5	1	R-12	TR-42			TR-42		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	750Ω	6-8Ω	KR-34				TA-25 ①			

① Tape and ignore primary CT; use 8Ω secondary tap.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	2-1/4"	PM	6-8Ω		22A06Z8	

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		TRUETONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	1N60	Detector (Pigtail)

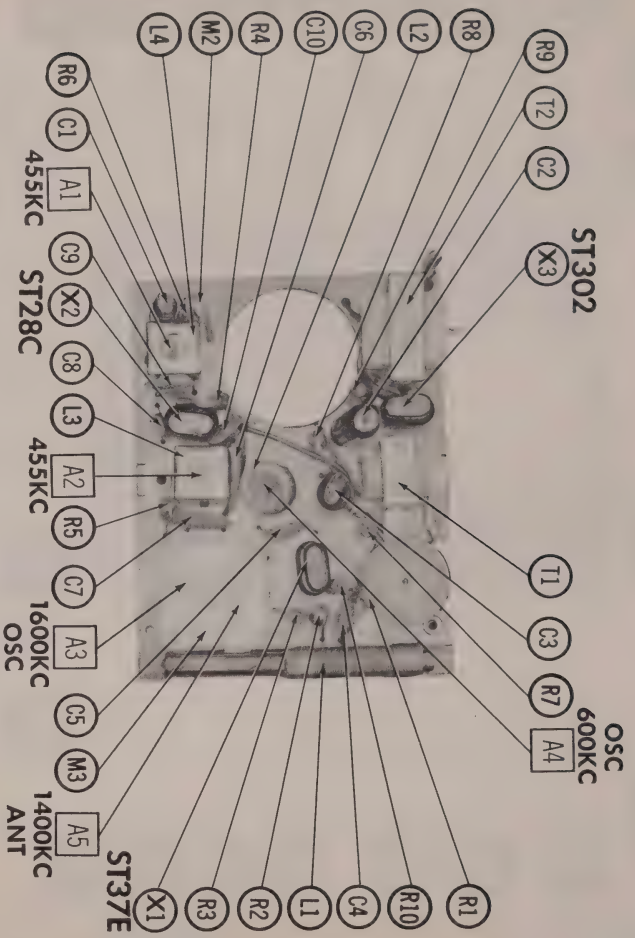
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Tuning Cap		2 Gang

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

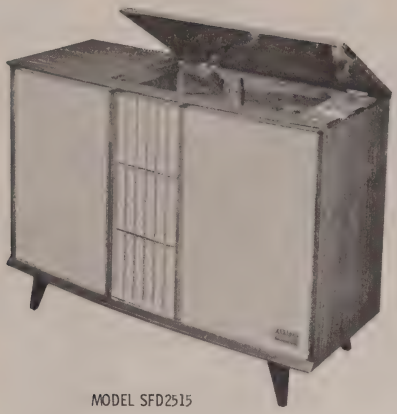
CHASSIS—TOP VIEW



PHOTOFACT® Folder

ZENITH MODELS DR100, DR102, SFD220M, R, T, SFD2515E, R, T, W (Ch. 2D30, 7D30)

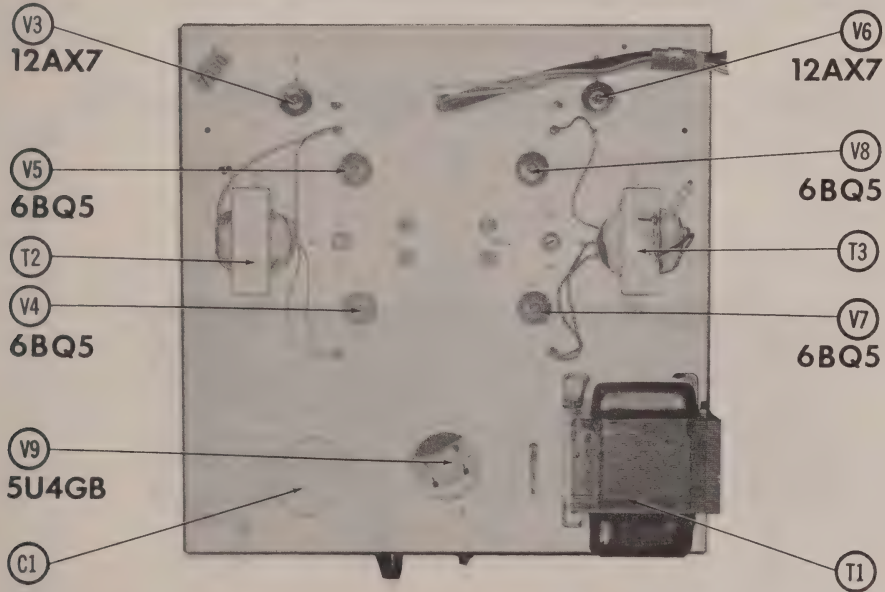
ZENITH MODELS DR100, DR102, SFD220M, R, T, SFD2515E, R, T, W (Ch. 2D30, 7D30)



MODEL SFD2515

TRADE NAME	Zenith Models SFD220M, SFD220R, SFD220T, SFD2515E, SFD2515R, SFD2515T, SFD2515W (Preamp. Ch. 2D30, Amp. Ch. 7D30) DR100, DR102 (Radial Speaker)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated 2 Tube Stereo Preamplifier, 7 Tube Stereo Amplifier, and 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 125 Watts, 1.1 Amp. @117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #169-108 — SEE ZENITH S-14078 — PHOTOFACT SET 392 FOLDER 14 OR RECORD CHANGER MANUAL RC-11



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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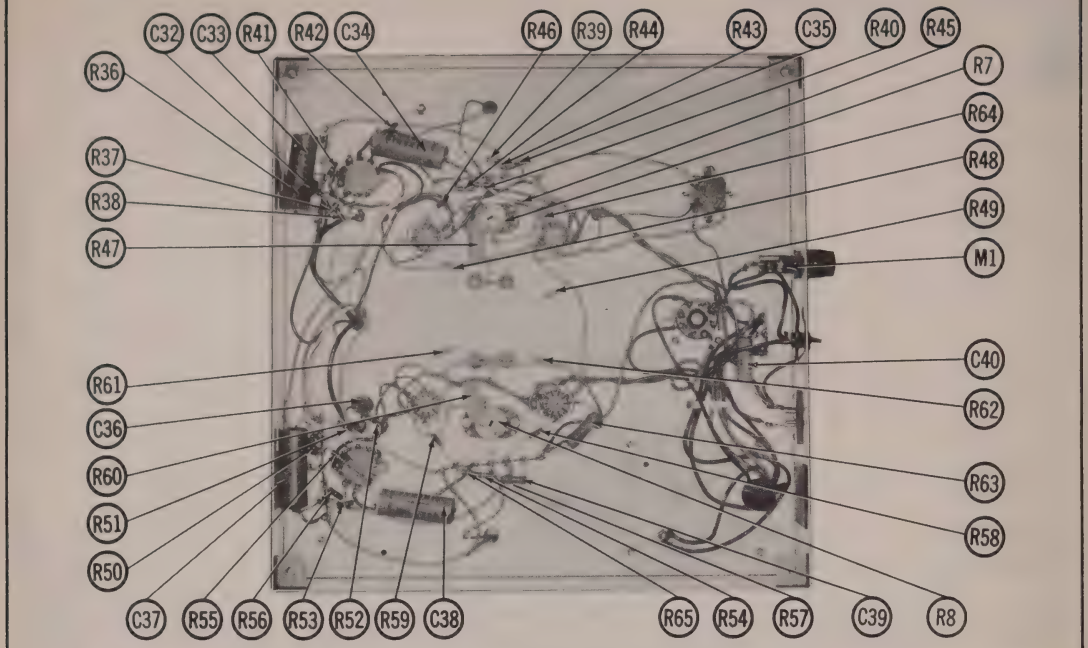
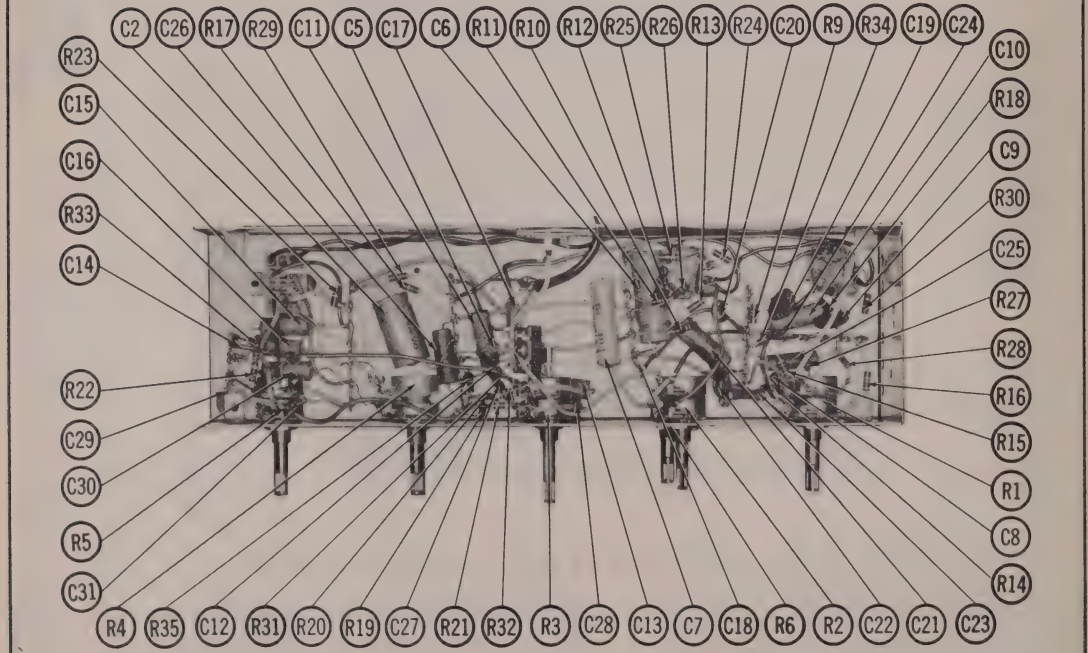
JT851

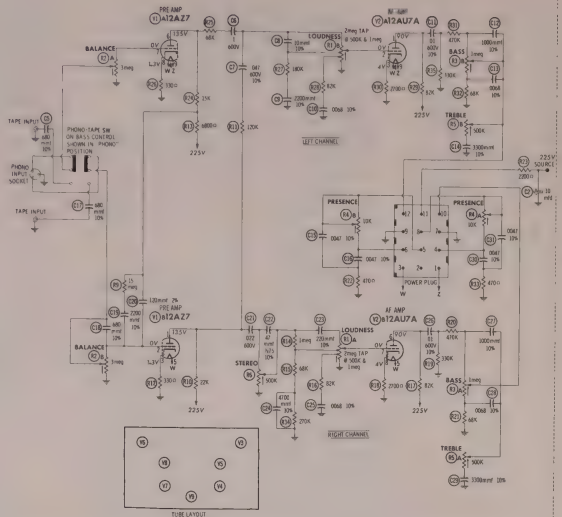
SET 496 FOLDER 18

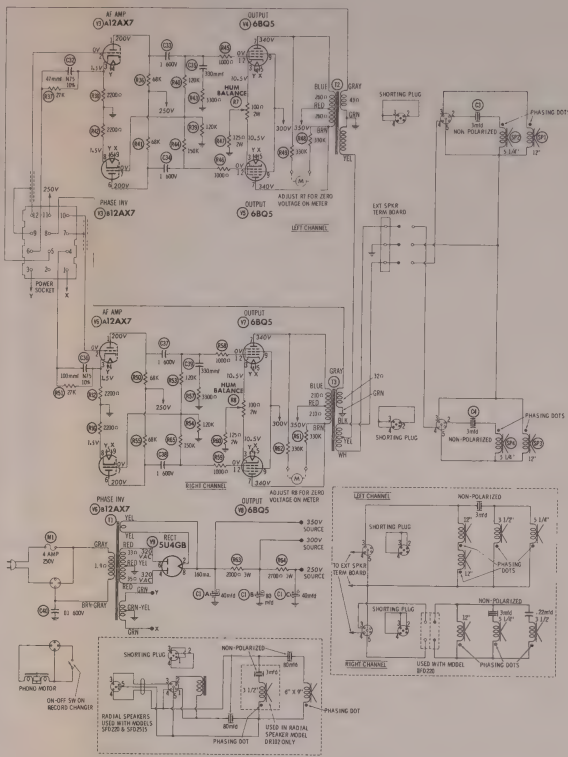


AMP CHASSIS - BOTTOM VIEW



PREAMP CHASSIS - BOTTOM VIEW





1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance of component values makes possible a variation of ±10% in voltage and resistance readings.
7. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AZ7	1.2BK	3meg	350Ω	2Ω	2Ω	1.2BK	3meg	350Ω	2Ω
V2	12AU7A	1.8BK	8Ω	270Ω	2Ω	2Ω	1.8BK	8Ω	270Ω	2Ω
V3	12AX7	1.72K	68K	220Ω	2Ω	2Ω	1.72K	125K	220Ω	2Ω
V4	6BQ5	260K	260K	140Ω	2Ω	2Ω	NC	1.26Ω	NC	1.200Ω
V5	6BQ5	270K	270K	140Ω	2Ω	2Ω	NC	1.26Ω	NC	1.200Ω
V6	12AX7	1.72K	68K	220Ω	2Ω	2Ω	1.72K	125K	220Ω	2Ω
V7	6BQ5	260K	260K	140Ω	2Ω	2Ω	NC	1.21Ω	NC	1.200Ω
V8	6BQ5	270K	270K	140Ω	2Ω	2Ω	NC	1.21Ω	NC	1.200Ω
V9	5U4GB	NC	1	NC	350	NC	330	NC	1	

1 THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ZENITH MODELS DR100, DR102, SFD220M, R, T, SFD2515E, R, T, W (Ch. 2D30, 7D30)

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel Preamp. - Right Channel Preamp.	12AZ7	V5	Left Channel Output	6BQ5
V2	Left Channel AF Amp. - Right Channel AF Amp.	12AU7A	V6	Right Channel AF Amp. - Phase Inverter	12AX7
V3	Left Channel AF Amp. - Phase Inverter	12AX7	V7	Right Channel Output	6BQ5
V4	Left Channel Output	6BQ5	V8	Right Channel Output	6BQ5
			V9	Rectifier	5U4GB

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■40	450	22-3106	AFH4-18-45	C0370	FP378	TMT-43	TVLS-3793.2*	
B	▬80	450							
C	▲40	450							
C2	10	350	22-2943	PRS1620	BR1045	TC62	TD-10-450	TVA-1604	
C3	3	30NP	22-2945	NP-PRS7405	BBR4-150	TCN503		TVANS-1215 *	
C4	3	30NP	22-2945	NP-PRS7405	BBR4-150	TCN503		TVANS-1215 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C6	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C7	.047 600V 10%		V84C6S47-10%		PM6D47	6DP-3-473	GEM-1615	6TM-S47
C8	10 10%		NPO-S1 10	D6-100	L10Q1	CCD-100	GP410	10TS-Q10
C9	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C10	.0068 200V 10%		V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C11	.01 600V 10%		V84C6S1-10%		PM6S1	6DP-2-103	GEM-1611	6TM-S1
C12	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C13	.0068 200V 10%		V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C14	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C15	.0047 200V 10%		V84C2D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C16	.0047 200V 10%		V84C2D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C17	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C18	680 10%		DI-680	DD-681	1R5T68	CCD-681	GP368	10TS-T68
C19	2200 10%		DI-220		PM6D22	CCD-222	GP222	10TS-D22
C20	120 2%	#22-3097				VCM-20-121G		
C21	.022 600V		P688N-022	DD-203	CUB6S22	6DP-2-223	GEM-6122	6TM-S22

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C22	47 N75 10%	#22-2376						
C23	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C24	4700 10%		DI-4700		PM6D47	CCD-472	GP247	10TS-D47
C25	.0068 200V 10%		V84C2D6840%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C26	.01 600V 10%		V84C6S1-10%		PM6S1	6DP-2-103	GEM-1611	6TM-S1
C27	1000 10%		DI-1000	DD-102	1R5D1	CCD-102	GP210	10TS-D10
C28	.0068 200V 10%		V84C2D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C29	3300 10%		DI-3300		PM6D33	CCD-332	JL-233	10TS-D33
C30	.0047 200V 10%		V84C2D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C31	.0047 200V 10%		V84C2D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C32	47 N75 10%	#22-2376						
C33	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C34	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C35	330		BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C36	100 N75 10%	#22-2397						
C37	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C38	.1 600V		P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1
C39	330		BPD-00033	DD-331	L10T33	CCD-331	GP333	10TS-T33
C40	.01 600V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1

\# Zenith Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *		63-4638	BT-175				Loudness, Right Channel
B	2meg *			STR-175				Loudness, Left Channel
R2A	3meg		63-4640					Balance, Left Channel
B	3meg							Balance, Right Channel
R3A	1meg		63-4639					Bass, Right Channel
B	1meg							Bass, Left Channel
C	Switch							Phono-Tape Switch
R4A	10K		63-4419	B-13			FA14L	Presence, Right Channel
B	10K			SR-13			RU14L	Presence, Left Channel
C	Shaft			Not Req.			CS3500	
R5A	500K		63-4418	B-60	AD47-500K-Z		FA55A	Treble, Right Channel
B	500K			SR-60	Not Req.		RU55A	Treble, Left Channel
C	Shaft			Not Req.	KSS-3		CS3500	
R6A	500K		63-4641	B-59	A47-500K-S	Q11-133	U50	Stereo
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R7A	100Ω	2(WW)	63-4468	WN-101	A43-100	WPK100	R100L	Hum Bal., Left Channel
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R8A	100Ω	2(WW)	63-4468	WN-101	A43-100	WPK100	R100L	Hum Bal., Right Channel
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

* Taps @ 500K and 1meg.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R9	15meg	
R10	22K	
R11	120K	
R12	330Ω	
R13	6800Ω	
R14	1meg	
R15	68K	
R16	82K	
R17	82K	
R18	2700Ω	
R19	330K	
R20	470K	
R21	68K	
R22	470Ω	
R23	2200Ω	
R24	15K	
R25	68K	
R26	330Ω	
R27	180K	

ITEM No.	RATING	REMARKS
R28	82K	
R29	82K	
R30	2700Ω	
R31	470K	
R32	68K	
R33	470Ω	
R34	270K	
R35	330K	
R36	68K	
R37	27K	
R38	2200Ω	
R39	120K	
R40	120K	
R41	68K	
R42	2200Ω	
R43	3300Ω	
R44	150K	
R45	1000Ω	
R46	1000Ω	

ITEM No.	RATING	REMARKS
R47	125Ω 2W	
R48	330K	
R49	330K	
R50	68K	
R51	27K	
R52	2200Ω	
R53	120K	
R54	120K	
R55	68K	
R56	2200Ω	
R57	3300Ω	
R58	1000Ω	
R59	1000Ω	
R60	125Ω 2W	
R61	330K	
R62	330K	
R63	2000Ω 3W	
R64	2700Ω 1W	
R65	150K	

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V Ⓐ 1.1A	640 VCT Ⓐ .160A	5V Ⓐ 3A	95-1641				PC-8422*		
	SEC. 3	SEC. 4	SEC. 5							
	6.3 VCT Ⓐ 4.3A									

* Drill new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC. 1	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5300Ω CT	65Ω	95-1698							
		SEC. 2								
		8Ω								
		SEC. 1								
T3	5000Ω	30Ω	95-1699							
		SEC. 2								
		12-16Ω CT.								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	49-903 *	12A6AZ6.4	* Used in Models SFD2515E, R, W
SP2	5 1/4"	PM	3-4Ω	49-896*	52A1	For other model speakers and connections refer to schematic.
SP3	12"	PM	6-8Ω	49-903*	12A6AZ6.4	
SP4	5 1/4"	PM	3-4Ω	49-896 *	52A1	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	4A	136-31	62-23	312004 (3AG 4A 250V)	342001	MTH4	HKP

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	142-93	13TB	Not Req.	26S	S1-1 S3-3	53	E98 E98X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	ZENITH PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78 RPM)	W-101STS † or W-101STD ♦	E98 † or E98D ♦	† Jewel ♦ Diamond
	(LP)	W-102MGS † or W-102MGD ♦	E98X † or E98XD ♦	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	46-2263	Loudness, Stereo, Bass, Presence, Treble
Knob	46-2284	Balance
Cabinet	14-2850M	Model SFD220M
Cabinet	14-2850R	Model SFD220R
Cabinet	14-2849E	Model SFD2515E
Cabinet	14-2849R	Model SFD2515R
Cabinet	14-2849W	Model SFD2515W
Cabinet Leg	96-257	Left Hand, Model SFD2515W
Cabinet Leg	96-258	Right Hand, Model SFD2515W
Cabinet Leg	96-259	Left Hand, Model SFD2515R
Cabinet Leg	96-260	Right Hand, Model SFD2515R
Cabinet Leg	96-261	Left Hand, Model SFD2515E
Cabinet Leg	96-262	Right Hand, Model SFD2515E

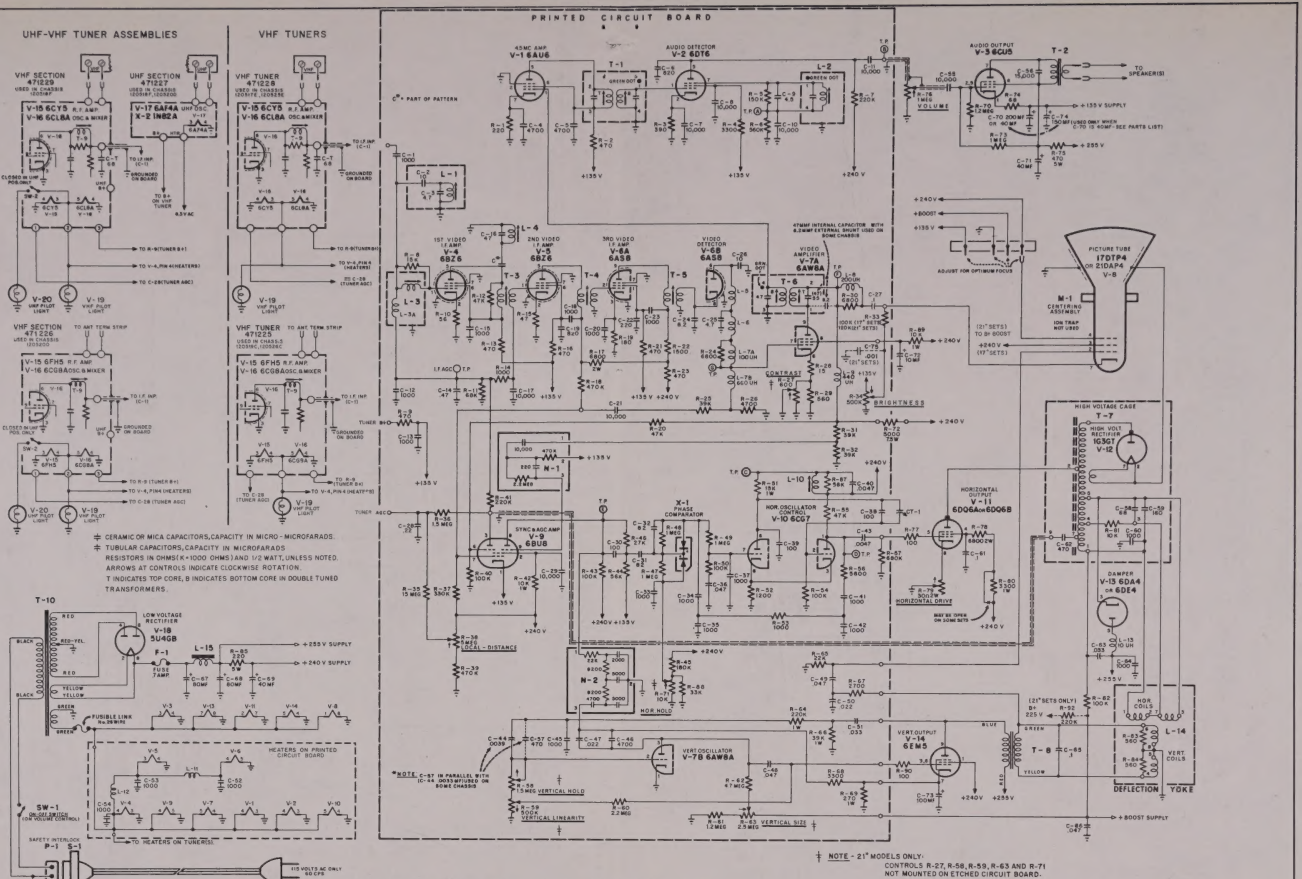
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

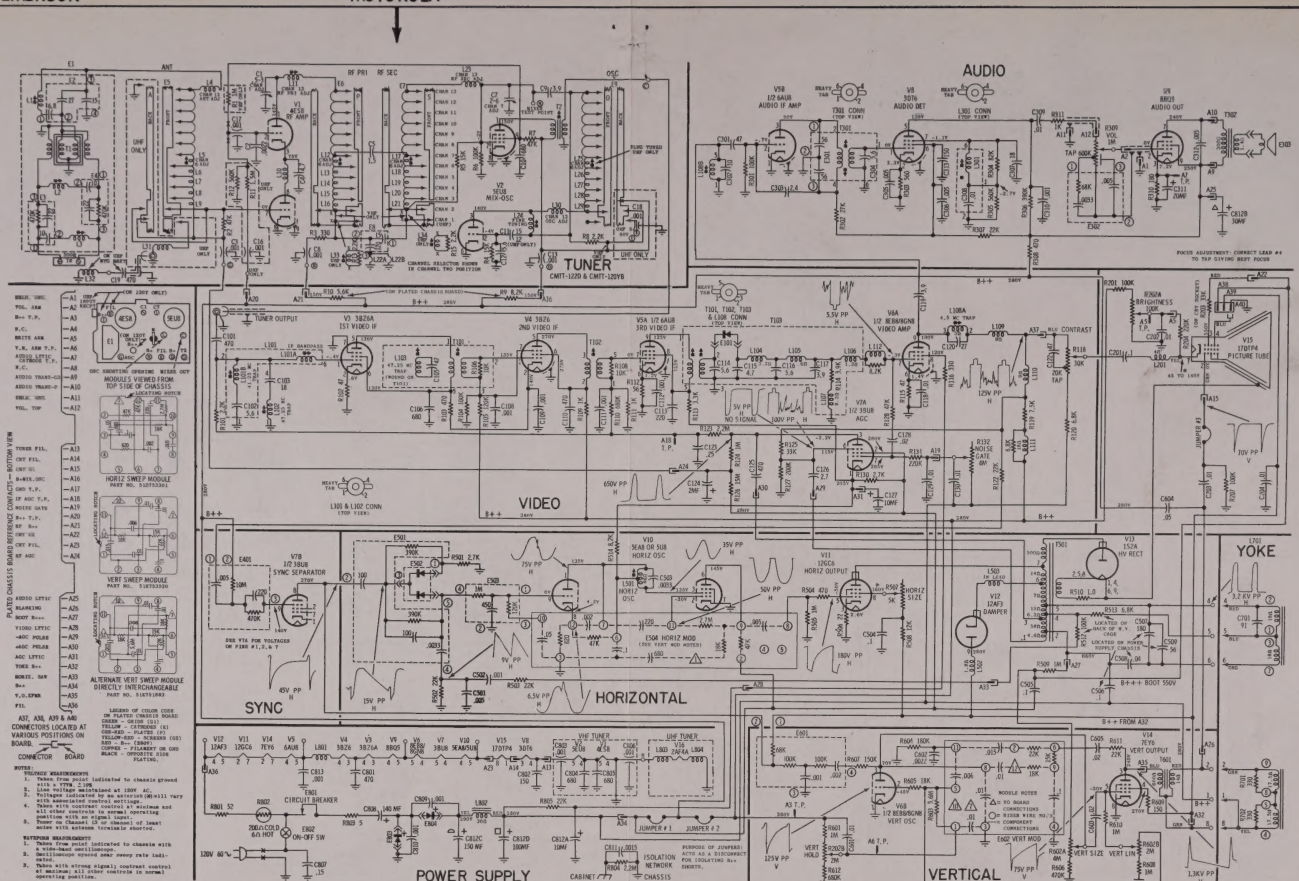


EMERSON MODELS 1600, 1601, 1602, 1604, 1605, 1608, 1609, 1610, 1612, 1613, 1614 (CH. 120517E, 120518F, 120519C, 120520D, 120526C)

Schematic Diagram Courtesy of Emerson Radio & Phonograph Corporation

← EMERSON

MOTOROLA


AUDIO
TUNER
VIDEO
SYNC
HORIZONTAL
VERTICAL
POWER SUPPLY
YOKE
PICTURE TUBE
V1 12AF3 RF AMP
V2 12GC8 MIX-OSC
V3 3B26A 1ST VIDEO IF
V4 3B26 2ND VIDEO IF
V5A 1/2 6AU8 3RD VIDEO IF
V6A 1/2 3BA6/3CN8 VIDEO AMP
V7A 1/2 3BU8 AGC
V7B 1/2 3BU8 SYNC SEPARATOR
V8 3S76 AUDIO DET
V9A 1/2 6AU8 AUDIO IF AMP
V10 SEAR OR SUB HORIZ OSC
V11 12GC6 HORIZ OUTPUT
V12 12AF3 DAMPER
V13 15DA HV RECT
V14 VERT OUTPUT
V15 17DTP4 PICTURE TUBE
V16 12AF3&A
V17 17DTP4 3D76
V18 BR21 AUDIO OUT
V19 1/2 BE3A/3CN8 VERT OSC
V20 1/2 BE3A/3CN8 VERT OSC
V21 1/2 6AU8 AUDIO IF AMP
V22 1/2 3BA6/3CN8 VIDEO AMP
V23 1/2 3BU8 AGC
V24 1/2 3BU8 SYNC SEPARATOR
V25 SEAR OR SUB HORIZ OSC
V26 12GC6 HORIZ OUTPUT
V27 12AF3 DAMPER
V28 15DA HV RECT
V29 17DTP4 PICTURE TUBE
V30 12AF3&A
V31 17DTP4 3D76
V32 BR21 AUDIO OUT
V33 1/2 BE3A/3CN8 VERT OSC
V34 1/2 BE3A/3CN8 VERT OSC
V35 1/2 6AU8 AUDIO IF AMP
V36 1/2 3BA6/3CN8 VIDEO AMP
V37 1/2 3BU8 AGC
V38 1/2 3BU8 SYNC SEPARATOR
V39 SEAR OR SUB HORIZ OSC
V40 12GC6 HORIZ OUTPUT
V41 12AF3 DAMPER
V42 15DA HV RECT
V43 17DTP4 PICTURE TUBE
V44 12AF3&A
V45 17DTP4 3D76
V46 BR21 AUDIO OUT
V47 1/2 BE3A/3CN8 VERT OSC
V48 1/2 BE3A/3CN8 VERT OSC
V49 1/2 6AU8 AUDIO IF AMP
V50 1/2 3BA6/3CN8 VIDEO AMP
V51 1/2 3BU8 AGC
V52 1/2 3BU8 SYNC SEPARATOR
V53 SEAR OR SUB HORIZ OSC
V54 12GC6 HORIZ OUTPUT
V55 12AF3 DAMPER
V56 15DA HV RECT
V57 17DTP4 PICTURE TUBE
V58 12AF3&A
V59 17DTP4 3D76
V60 BR21 AUDIO OUT
V61 1/2 BE3A/3CN8 VERT OSC
V62 1/2 BE3A/3CN8 VERT OSC
V63 1/2 6AU8 AUDIO IF AMP
V64 1/2 3BA6/3CN8 VIDEO AMP
V65 1/2 3BU8 AGC
V66 1/2 3BU8 SYNC SEPARATOR
V67 SEAR OR SUB HORIZ OSC
V68 12GC6 HORIZ OUTPUT
V69 12AF3 DAMPER
V70 15DA HV RECT
V71 17DTP4 PICTURE TUBE
V72 12AF3&A
V73 17DTP4 3D76
V74 BR21 AUDIO OUT
V75 1/2 BE3A/3CN8 VERT OSC
V76 1/2 BE3A/3CN8 VERT OSC
V77 1/2 6AU8 AUDIO IF AMP
V78 1/2 3BA6/3CN8 VIDEO AMP
V79 1/2 3BU8 AGC
V80 1/2 3BU8 SYNC SEPARATOR
V81 SEAR OR SUB HORIZ OSC
V82 12GC6 HORIZ OUTPUT
V83 12AF3 DAMPER
V84 15DA HV RECT
V85 17DTP4 PICTURE TUBE
V86 12AF3&A
V87 17DTP4 3D76
V88 BR21 AUDIO OUT
V89 1/2 BE3A/3CN8 VERT OSC
V90 1/2 BE3A/3CN8 VERT OSC
V91 1/2 6AU8 AUDIO IF AMP
V92 1/2 3BA6/3CN8 VIDEO AMP
V93 1/2 3BU8 AGC
V94 1/2 3BU8 SYNC SEPARATOR
V95 SEAR OR SUB HORIZ OSC
V96 12GC6 HORIZ OUTPUT
V97 12AF3 DAMPER
V98 15DA HV RECT
V99 17DTP4 PICTURE TUBE
V100 12AF3&A
V101 17DTP4 3D76
V102 BR21 AUDIO OUT
V103 1/2 BE3A/3CN8 VERT OSC
V104 1/2 BE3A/3CN8 VERT OSC
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V116 BR21 AUDIO OUT
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V118 1/2 BE3A/3CN8 VERT OSC
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V128 12AF3&A
V129 17DTP4 3D76
V130 BR21 AUDIO OUT
V131 1/2 BE3A/3CN8 VERT OSC
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V144 BR21 AUDIO OUT
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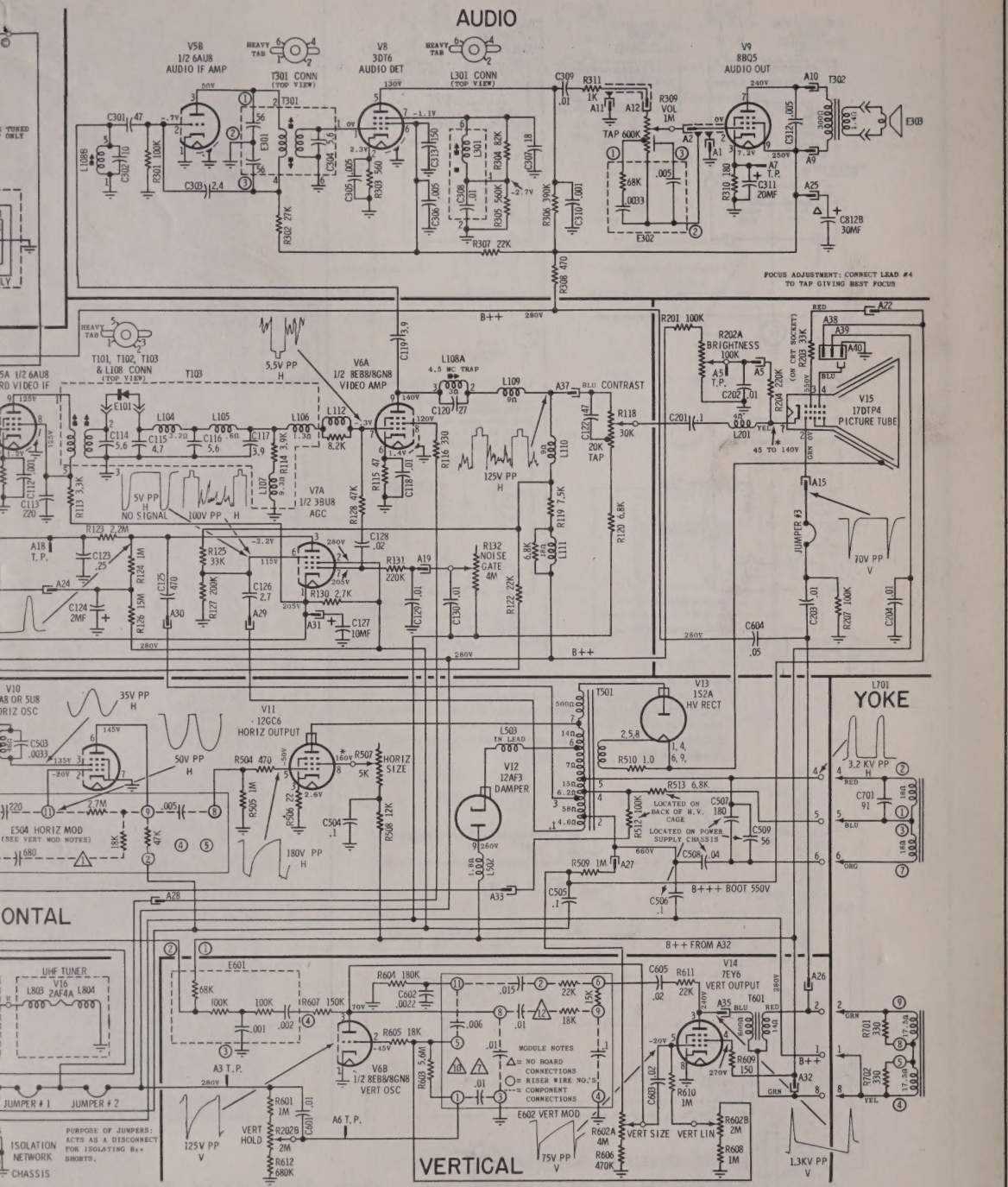
V708 1/2 3BA6/3CN8 VIDEO AMP
V709 1/2 3BU8 AGC
V710 1/2 3BU8 SYNC SEPARATOR
V711 SEAR OR SUB HORIZ OSC
V712 12GC6 HORIZ OUTPUT
V713 12AF3 DAMPER
V714 15DA HV RECT
V715 17DTP4 PICTURE TUBE
V716 12AF3&A
V717 17DTP4 3D76
V718 BR21 AUDIO OUT
V719 1/2 BE3A/3CN8 VERT OSC
V720 1/2 BE3A/3CN8 VERT OSC
V721 1/2 6AU8 AUDIO IF AMP
V722 1/2 3BA6/3CN8 VIDEO AMP
V723 1/2 3BU8 AGC
V724 1/2 3BU8 SYNC SEPARATOR
V725 SEAR OR SUB HORIZ OSC
V726 12GC6 HORIZ OUTPUT
V727 12AF3 DAMPER
V728 15DA HV RECT
V729 17DTP4 PICTURE TUBE
V730 12AF3&A
V731 17DTP4 3D76
V732 BR21 AUDIO OUT
V733 1/2 BE3A/3CN8 VERT OSC
V734 1/2 BE3A/3CN8 VERT OSC
V735 1/2 6AU8 AUDIO IF AMP
V736 1/2 3BA6/3CN8 VIDEO AMP
V737 1/2 3BU8 AGC
V738 1/2 3BU8 SYNC SEPARATOR
V739 SEAR OR SUB HORIZ OSC
V740 12GC6 HORIZ OUTPUT
V741 12AF3 DAMPER
V742 15DA HV RECT
V743 17DTP4 PICTURE TUBE
V744 12AF3&A
V745 17DTP4 3D76
V746 BR21 AUDIO OUT
V747 1/2 BE3A/3CN8 VERT OSC
V748 1/2 BE3A/3CN8 VERT OSC
V749 1/2 6AU8 AUDIO IF AMP
V750 1/2 3BA6/3CN8 VIDEO AMP
V751 1/2 3BU8 AGC
V752 1/2 3BU8 SYNC SEPARATOR
V753 SEAR OR SUB HORIZ OSC
V754 12GC6 HORIZ OUTPUT
V755 12AF3 DAMPER
V756 15DA HV RECT
V757 17DTP4 PICTURE TUBE
V758 12AF3&A
V759 17DTP4 3D76
V760 BR21 AUDIO OUT
V761 1/2 BE3A/3CN8 VERT OSC
V762 1/2 BE3A/3CN8 VERT OSC
V763 1/2 6AU8 AUDIO IF AMP
V764 1/2 3BA6/3CN8 VIDEO AMP
V765 1/2 3BU8 AGC
V766 1/2 3BU8 SYNC SEPARATOR
V767 SEAR OR SUB HORIZ OSC
V768 12GC6 HORIZ OUTPUT
V769 12AF3 DAMPER
V770 15DA HV RECT
V771 17DTP4 PICTURE TUBE
V772 12AF3&A
V773 17DTP4 3D76
V774 BR21 AUDIO OUT
V775 1/2 BE3A/3CN8 VERT OSC
V776 1/2 BE3A/3CN8 VERT OSC
V777 1/2 6AU8 AUDIO IF AMP
V778 1/2 3BA6/3CN8 VIDEO AMP
V779 1/2 3BU8 AGC
V780 1/2 3BU8 SYNC SEPARATOR
V781 SEAR OR SUB HORIZ OSC
V782 12GC6 HORIZ OUTPUT
V783 12AF3 DAMPER
V784 15DA HV RECT
V785 17DTP4 PICTURE TUBE
V786 12AF3&A
V787 17DTP4 3D76
V788 BR21 AUDIO OUT
V789 1/2 BE3A/3CN8 VERT OSC
V790 1/2 BE3A/3CN8 VERT OSC
V791 1/2 6AU8 AUDIO IF AMP
V792 1/2 3BA6/3CN8 VIDEO AMP
V793 1/2 3BU8 AGC
V794 1/2 3BU8 SYNC SEPARATOR
V795 SEAR OR SUB HORIZ OSC
V796 12GC6 HORIZ OUTPUT
V797 12AF3 DAMPER
V798 15DA HV RECT
V799 17DTP4 PICTURE TUBE
V800 12AF3&A
V801 17DTP4 3D76
V802 BR21 AUDIO OUT
V803 1/2 BE3A/3CN8 VERT OSC
V804 1/2 BE3A/3CN8 VERT OSC
V805 1/2 6AU8 AUDIO IF AMP
V806 1/2 3BA6/3CN8 VIDEO AMP
V807 1/2 3BU8 AGC
V808 1/2 3BU8 SYNC SEPARATOR
V809 SEAR OR SUB HORIZ OSC
V810 12GC6 HORIZ OUTPUT
V811 12AF3 DAMPER
V812 15DA HV RECT
V813 17DTP4 PICTURE TUBE
V814 12AF3&A
V815 17DTP4 3D76
V816 BR21 AUDIO OUT
V817 1/2 BE3A/3CN8 VERT OSC
V818 1/2 BE3A/3CN8 VERT OSC
V819 1/2 6AU8 AUDIO IF AMP
V820 1/2 3BA6/3CN8 VIDEO AMP
V821 1/2 3BU8 AGC
V822 1/2 3BU8 SYNC SEPARATOR
V823 SEAR OR SUB HORIZ OSC
V824 12GC6 HORIZ OUTPUT
V825 12AF3 DAMPER
V826 15DA HV RECT
V827 17DTP4 PICTURE TUBE
V828 12AF3&A
V829 17DTP4 3D76
V830 BR21 AUDIO OUT
V831 1/2 BE3A/3CN8 VERT OSC
V832 1/2 BE3A/3CN8 VERT OSC
V833 1/2 6AU8 AUDIO IF AMP
V834 1/2 3BA6/3CN8 VIDEO AMP
V835 1/2 3BU8 AGC
V836 1/2 3BU8 SYNC SEPARATOR
V837 SEAR OR SUB HORIZ OSC
V838 12GC6 HORIZ OUTPUT
V839 12AF3 DAMPER
V840 15DA HV RECT
V841 17DTP4 PICTURE TUBE
V842 12AF3&A
V843 17DTP4 3D76
V844 BR21 AUDIO OUT
V845 1/2 BE3A/3CN8 VERT OSC
V846 1/2 BE3A/3CN8 VERT OSC
V847 1/2 6AU8 AUDIO IF AMP
V



R-A (CH. RTS-433, Y)

Schematic Diagram Courtesy of Motorola Inc.